For CONTENTS, see pp. iii and iv of Cover.

pp. 195-274.] [April 15, 1916.

TROPICAL DISEASES BULLETIN

IMPERIAL INSTITUTE 18 APR. 1916 LIBRARY

Vol. 7. 1916. No. 4.

EXCHANGE COPY

ISSUED UNDER
THE DIRECTION OF THE
HONORARY MANAGING COMMITTEE
OF THE
TROPICAL DISEASES
BUREAU.

General Editor:
THE DIRECTOR OF THE BUREAU.

COMMONWEALTH MYCOLOGICAL INSTITUTE 26 MAY 1971

London:
TROPICAL DISEASES BUREAU,
Imperial Institute, S.W.

Sold by BAILLIÈRE, TINDALL & COX,
8, Henrietta Street, Covent Garden, W.C.

Price 1/6 net.] [All Rights Reserved.

HONORARY MANAGING COMMITTEE.

Chairman:

The Right Honourable Sir J. West Ridgeway, G.C.B., G.C.M.G., K.C.S.I., LL.D.
(who is also Chairman of the Advisory Committee of the Tropical Diseases Research Fund).

Sir John Rose Bradford, K.C.M.G., C.B., F.R.S.
(representing the Royal Society).

Surgeon-General Sir David Bruce, C.B., F.R.S.
Surgeon-General Sir R. Havelock Charles, I.M.S., G.C.V.O.
Colonel Sir William B. Leishman, C.B., F.R.S., K.H.P.
Sir John M'Fadyean, M.R.C.V.S.
Sir Patrick Manson, G.C.M.G., F.R.S.
Sir Ronald Ross, K.C.B., F.R.S.
Sir S. Stockman, M.R.C.V.S.

Mr. E. C. Blech, C.M.G.
(representing the Foreign Office and Sudan Government).

Mr. H. J. Read. C.B., C.M.G.
(representing the Colonial Office),
with

of the Colonial Office, as Secretary.

STAFF OF THE BUREAU.

Director:
A. G. Bagshawe, C.M.G., M.B., D.P.H. Cantab.,
of the Uganda Medical Staff.

Assistant Director:

Librarian and Secretary:
R. L. Sheppard.

Sectional Editors:
P. S. Abraham, M.D., B.Sc.
Andrew Balfour, C.M.G., M.D., D.P.H. Cantab.
Fleet-Surgeon P. W. Bassett-Smith, R.N., C.B., M.R.C.P.
R. T. St. John Brooks, M.D., D.T.M. & H.
H. B. Fantham, M.A., D.Sc.
Edward Hindle, Ph.D.
Colonel W. G. King, C.I.E., I.M.S. (retd.).
J. C. G. Ledingham, M.B. Ch.B., D.Sc.
R. T. Leiper, D.Sc., M.B., Ch.B.
J. B. Nias, M.D., M.R.C.P.
W. J. Penfold, M.D., D.P.H.
F. M. Sandwith, M.D., F.R.C.P.
H. Schütze, M.D.
C. M. Wenyon, M.B., B.S., B.Sc.
Warrington Yorke, M.D.

Editor of the Tropical Veterinary Bulletin:
A. Leslie Sheather, B.Sc., M.R.C.V.S.

Now Ready. Large Royal Octavo.
Pp. xii. + 261.
With 3 Coloured Maps, 5 Coloured and 68 other Plates.
Price 7s. 6d. net.

SLEEPING SICKNESS:

BEING A RECORD OF FOUR YEARS' WAR AGAINST IT IN PRINCIPE, PORTUGUESE WEST AFRICA.

By B. F. BRUTO DA COSTA, J. FIRMINO SANT'ANNA, A. CORREI DOS SANTOS, and M. G. DE ARAUJO ALVARES.

Translated by
Lieut.-Col. J. A. WYLLIE, F.R.G.S.

Published for The Centro Colonial, Lisbon, by Baillière, Tindall & Cox, 8, Henrietta Street, Covent Garden, London.

A NEW ANTISEPTIC

for Infected Wounds, etc.

TRADE MARK **'SOLOID'** BRAND
'TOLAMINE'
(Trade Mark)

Strengths: gr. 8·75 and gr. 87·5

'TOLAMINE' is the title given to para-toluene-sodium-sulphochloramide, by Burroughs Wellcome & Co.

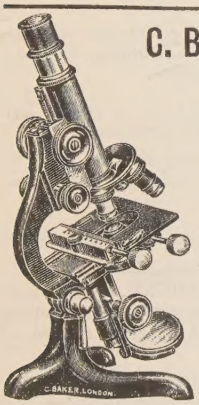
Molecule for molecule the germicidal activity of 'Tolamine' is four times that of sodium hypochlorite.

'Soloid' 'TOLAMINE,' gr. 8·75, is issued in bottles of 100, and gr. 87·5 in tubes of 10.

Obtainable of all Chemists

BURROUGHS WELLCOME & CO
LONDON

E 460 COPYRIGHT



C. BAKER'S OWN LONDON-MADE MICROSCOPES

NEW "T.D." (Tropical Diseases) MODEL, as figured, with built-on (easily removable) mechanical stage, giving movements of 60 m/m in the horizontal and 25 m/m in the vertical position, Abbe condenser and iris, triple nosepiece, eyepieces: 2, 4, and 5, objectives: 1in., ½in., ⅙in., and 1/12in. oil immersion, N.A. 1.30, dark ground illuminator and stop for 1/12in. objective. Magnifications from 30-1040. In mahogany cabinet £25 5 0

NEW FORMULA 1/12in. OIL IMMERSION, N.A. 1.30 £5 0 0

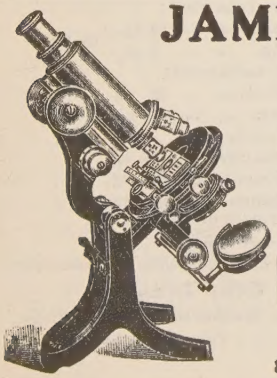
NEW CONCENTRIC DARK GROUND ILLUMINATOR £1 10 0

Owing to the increased cost of labour and raw material, we are compelled to raise these prices 10%.

C. BAKER, 244, High Holborn, London.

Established 1765.

CATALOGUE OF MICROSCOPES AND ACCESSORIES POST FREE.



JAMES SWIFT & SON,

OPTICAL AND SCIENTIFIC INSTRUMENT MAKERS.

Contractors to all Scientific Departments of H.M. Government.

Grands Prix, Diplomas of Honour, and Gold Medals at London, Paris, Brussels, &c.

"UNIVERSAL" MICROSCOPE

The latest and most highly developed stand for modern research work. With centring, rotating mechanical stage.

Complete, with 3 objectives, 2 oculars, Abbe condenser, triple nosepiece, etc., in cabinet, **£26.**

N.B.—All our Microscopes (including the Lenses) are made in our own workshops on the Premises.

Catalogue gratis on request.

UNIVERSITY OPTICAL WORKS,
81, TOTTENHAM COURT ROAD, LONDON.

SALVARSAN AND NEOSALVARSAN
EFFECTIVE SUBSTITUTES.

GALYL

GALYL is tetraoxydiphosphaminodiarsenobenzene and has been discovered by Dr. MOUNEYRAT.

It is found in the form of a clean yellow powder, liable to change when exposed to the air.

GALYL is as effective as SALVARSAN or NEOSALVARSAN on Spirochætes and Trypanosomes and free from the neurotropic and congestive action of these preparations

FOR INTRAVENOUS INJECTIONS:—

(1) **DILUTE.**—GALYL is supplied in neutral glass ampoules containing the necessary dose of Sodium Carbonate. Sterile distilled water being only used for the dissolution.

(2) **CONCENTRATED.**—A special outfit containing one dose GALYL, one ampoule sterilised solution, and one small filter is supplied.

DOSES: 0·20—0·25—0·30—0·35—0·40.

For INTRAMUSCULAR INJECTIONS GALYL is supplied in oily emulsion.

DOSES: 0·20—0·30—0·40.

HECTINE

HECTINE is Sodii Benzo-sulpho-p-aminophenyl arsonas.

HECTINE consists of colourless needles, very soluble in water, containing approximately 21 per cent of arsenic.

The preparation is put up in sterile ampoules for INTRAMUSCULAR INJECTIONS:—

AMPOULES A containing 10 cg. in 1 c.c.
AMPOULES B „ 20 cg. in 1 c.c.
PILLS „ 10 cg.

Ref., THE LANCET, 26/6/15—

"Severe case of intractable syphilis treated satisfactorily with Hectine."

HECTARGYRE

Mercurial salt of HECTINE, a combined arsenico-mercurial treatment of Syphilis, especially recommended after a course of Galyl.

The preparation is put up in sterile ampoules for INTRAMUSCULAR INJECTIONS:—

AMPOULES A containing:
Hectine ... 10 cg.
Hg. ... ... 1 cg. in 1 cc.

AMPOULES B containing:
Hectine ... 20 cg.
Hg. ... ... 1½ cg. in 1 cc.

PILLS containing:
Hectine ... 10 cg.
Protoiod. of Hg. 1 cg.
Opium Extract 1 cg.

IN PHIALS OF 24 PILLS.

Complete literature on application to the Sole Agents for the British Empire, Colonies and Dominions—

THE ANGLO-FRENCH DRUG CO., Ltd.,

Late M. BRESILLON & CO., Gamage Buildings, Holborn, London, E.C.

'Phone: Holborn 1311. Telegrams: "Ampsalvas."

TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 7.] 1916. [No. 4.

AMOEBIASIS AND DYSENTERY.

Amoebiasis.

Ross (Ronald) & Thomson (David). **Studies on Egyptian Sand Amoebae.**—*Proc. R. Soc. Med.* Sect. of Epidemiol. & State Med. 1916. Jan. Vol. 9. No. 3. pp. 33–48.

The authors commenced their research by depositing portions of dysenteric stools, containing blood, mucus, and pathogenic amoebae, on the ordinary dry, sun-baked sand obtained outside a laboratory in Alexandria. There was no trace of the original pathogenic amoebae after two days, but usually on the third day very many actively moving organisms of the *Amoeba limax* type were found on the sand where the faeces had been deposited. Other protozoa also made their appearance, namely, a "balantidium-like" infusorian and certain small mono- and bi-flagellates. These protozoal organisms were proved to come from the sand, as was shown by a series of cultural experiments using sterilised and unsterilised sand.

The protozoa exist in the dry sand in the form of cysts or spores. Abundant motile amoebae and flagellates were obtained from cultures of sand taken at the depth of one foot, but none developed from sand at a depth of four feet. The protozoa were not local in distribution but were widespread. They were more abundant in sand from contaminated neighbourhoods, and cultures from apparently clean districts did not yield protozoa till after those from contaminated ones. Sand blown from the south by the "khamseen" winds has been found to be heavily infected with bacterial organisms. From experiments it is concluded that the amoeba of the limax type is not injured by excess of water. No protozoa were cultured from Alexandrian tap-water.

The sand protozoa are generally natural free-living aquatic organisms but some are capable of living a parasitic life in the intestines of man and animals, as they have an affinity for faecal matter which aids their growth and multiplication in the free state. Active protozoa begin to develop from about the fifth day when sterile water and sand are kept in the light in a glass vessel. The first to appear are certain infusoria and flagellates, and also spirochaetes. After a fortnight to three weeks chlorophyllaceous protozoa appear. The source of some

(C249) Wt. 3137/63. 1,850. 4.16. B.&F.Ltd. Gp.11/4. A

of these organisms has been traced. Amoebae, flagellates and large "balantidium-like" cysts were found in a sample of horse dung taken before it reached the sand. These protozoa grow well in deposits of human faeces on sand. "The horses in Egypt swallow large quantities of sand, sand colic is a common complaint with them, and sometimes causes death. In such cases, if a post-mortem is performed, very large quantities of sand are found in their large intestine. Horses, at least, must therefore act as a kind of culture incubator for several of the sand organisms." The protozoal cysts and spores of Egyptian sand are considered to be derived in part from the faecal contamination of man and animals, and partly from the dried-up sludge of stagnant water which has been dispersed by the wind. The cysts and spores can retain their vitality for months in the dry sand.

Sand simply moistened with bouillon forms a good medium for the growth of some organisms. A layer of half an inch of bouillon inhibits growth, possibly by excluding air. It was also found that deposits of dysenteric stools placed on sand, in which *Amoeba limax* grew well, were distinctly alkaline. They seemed to grow best when the temperature of the laboratory was about 80° F., and grow well at 70° F., or even 60° F., but growth then is slower. In an ice chest at 55° F. no development occurred.

From experiments, it is believed that 1 cc. of sand contained about 100 amoeba cysts. Cultures on agar of dust from a hospital ward gave a growth of *Amoeba limax*, probably derived from the sand. It was also shown that "the ordinary chlorination is insufficient to kill the sand organisms in a mixture of sand and water."

A description of the morphology of *Amoeba limax* is given.

The flagellates observed were pyriform in shape and usually were about 5μ in length. Some were uniflagellate, others biflagellate. Temporary encystment under drought conditions occurred.

The "balantidium-like" organism was free-swimming, measured 30μ to 40μ long, had a large macronucleus and a small micronucleus, and encysted when the medium dried up. Four daughter organisms developed within the cyst.

Kittens injected rectally with sand, or fed on dried up cultures from sand, passed faeces which were negative for protozoa, and showed no symptoms of disease.

The present investigations "have shown clearly that one should endeavour to prevent the contamination of water and sand with faecal matter." Practical suggestions for avoiding soil contamination are given.

"Not only human faecal matter but horse-dung should be disposed of with exceeding great care. Where there is no proper sewage system, the latrines should be dug very deep, or better still, the faeces should be passed into metal buckets and kept thoroughly moist with antiseptic fluid, such as cresol or an emulsion of one of the crude oils. Flies will not land on the contents of the buckets treated in this way, nor will the faecal matter dry up and be blown about. The toilet paper in the buckets should be set on fire several times daily, and the hands should be rinsed in antiseptic lotion after each defaecation. The contents of the buckets should be buried deeply, or, better still, burnt in a destructor. Horse-dung should certainly be burnt. In this way and this alone can dysentery and the flagellate diarrhoeas be prevented, whether for an army in the field or for a civil community."

Shallow latrines are dangerous in dry sand because in them dry faeces may be scooped out and blown about by the wind.

With regard to the danger from flies, it is considered unlikely that flies developing from dead bodies can carry the parasite of amoebic dysentery to food, unless they have previously alighted on dysenteric stools. The proper disposal of faeces, then, means no dysentery. A highly efficient organisation for the thorough and rapid disposal of faecal matter is essential for the prevention of intestinal troubles of protozoal origin.

H. B. Fantham.

GAUDUCHEAU (A.). **Critique de quelques travaux récents sur le rôle pathogène des amibes dans le dysenterie.**—*Bull. Soc. Méd.-Chirurg. Indochine.* 1915. July. Vol. 6. No. 7. pp. 258–267.

The author discusses somewhat fully the more recent work on the amoebae found in cases of dysentery. By a series of comparisons, he considers that hard and fast distinctions between harmless and harmful amoebae cannot be made. Morphological variation among amoebae generally considered to be the excitants of dysentery links them with those usually believed to be innocuous. He criticises more particularly the differential characters of *Entamoeba coli* and *E. tetragena* as set forward by WALKER and SELLARDS (1913). He shows that the differential characters as defined by them break down, or are explicable by reference to other phenomena that are non-specific and of general application, such as conditions of fatigue, abundance of nutritive materials, etc.

The conclusions reached may be thus translated :—

The author desired to show that the most recent experimental proofs of the pathogenic rôle of amoebae (due to WALKER) were founded on insufficient morphological distinctions between *E. coli* and *E. histolytica*, the former being considered harmless, the latter pathogenic. The infection-material used was necessarily impure, and the differential characters being contestable, more work on the intestinal amoebae is needed on a new basis.

It is not yet proved that amoebae are sufficient pathogenic factors alone to provoke the maladies known as amoebiases.

The activity of amoebae in liver abscess and intestinal ulcer is evident, but may be secondary.

It is not certain that tetranucleate cysts and those with eight nuclei belong to two different species, nor that the eight-nucleate species of Tonkin is the same as that of Europe.

If the ubiquity of a harmless species and of a pathogenic one were established, the latter should be termed *E. dysenteriae* on account of priority over *histolytica*. [But the species *dysenteriae* was insufficiently defined by its creators.]

The cysts with eight nuclei are found in Tonkin in diseased intestines as well as the tetranucleate forms. There is, then, no reason for considering the one harmless and the other injurious, so far as the amoebae of Tonkin are concerned. [Has the author sufficiently allowed for mixed infections ?]

Practically, from the clinical, therapeutical and prophylactic points of view, all entamoebic forms should be considered and treated in the same way.

New work is necessary to determine the real pathogenic effects of the amoebae, and to determine the etiological mechanism of the dysenteries.

H. B. F.

LYNCH (Kenneth M.). **The Rat a Carrier of a Dysenteric Ameba.**—*Jl. Amer. Med. Assoc.* 1915. Dec. 25. Vol. 65. No. 26. pp. 2232–2234.

The experiments began with the feeding of a large brown rat with human faeces containing *Endamoeba histolytica* as well as *Trichomonas intestinalis.* At the end of three weeks the rat was noticed to be getting thin, and to be more sluggish than normal. Emaciation increased and at the end of a month the rat appeared to be very sick and had developed a mucous diarrhoea. The faecal matter when examined fresh and warm contained trichomonads, leucocytes, desquamated epithelium, shreds of intestinal mucosa, red blood cells and numerous active and resting amoebae. The amoebae were "identical with those in the faeces with which [the rat] was fed." The rat died on the thirty-second day after feeding.

Post-mortem the rodent showed "general anaemia, acute mesenteric lymphadenitis, late perilobular cirrhosis of the liver with microscopic periportal abscesses in which no cells like amoebas were found, jaundice of the liver and kidneys." The condition of the liver may have been due to extensive infiltration with cysticerci and secondary infection. There was acute catarrhal enteritis in the small intestine and large intestine. Active and encysted amoebae were present in the caecum, the wall of which "was the seat of an acute ulcerative inflammation practically identical grossly and microscopically with the more acute type of human amebic colitis." The morphology of the amoeba is briefly described; it measured 20μ to 60μ.

These findings brought to the author's mind "the habits of the rat, and his liking for faeces and also for almost any and all of our food and drink." The author continued his experiments and fed twenty rats with human faeces containing active and resting dysenteric amoebae. Four of the rats followed the same course as the first, and exhibited ulceration of the caecum. Faeces of infected rats were fed to other rats, and the latter developed amoebiasis, as did also a normal rat placed in the same cage.

The experimental rats came from a source shown to be free from spontaneous amoebic infection. However, a rat from another source—a negro habitation—showed infection with *Endamoeba histolytica.* A case of human amoebic dysentery had come from the same locality. Similarly infected rats have been obtained from two other localities in Charleston, South Carolina.

The author concludes that:—

"1. The rat (*Mus norvegicus*) suffers from spontaneous amoebic dysentery similar to that occurring in man.

"2. This apparently occurs in endemic foci in Charleston, S.C.

"3. The ameba found in the cases of rat infection here reported are indistinguishable from *Endamoeba histolytica.*

"4. This rat may be infected with *Endamoeba histolytica* by allowing it to eat human faeces containing this parasite.

"5. The disease thus produced is practically the same as that occurring in man and from spontaneous infection in rats.

"6. This infection, spontaneous and experimental, may be transmitted from the infected to the healthy rat by close association, that is, living, eating and drinking together

"7. The rat is a possible and probable disseminator of dysenteric amoebas pathogenic for man."

H. B. F.

BARLOW (Nathan). **Endamebic Dysentery. Relapse after the Use of Emetine.**—*New York Med. Jl.* 1915. Oct. 23. Vol. 102. No. 17. Whole No. 1925. pp. 845–848.

Barlow has had an experience of over 300 cases of dysentery treated with emetine. It is more difficult to get rid of amoebae when flagellates, ciliates or metazoa are present. The mild cases are more susceptible of cure; extensive ulceration harbours the amoebae. Patients with hepatitis or liver abscess are usually free from relapses, partly due to more thorough treatment. The minimum treatment to ensure against relapse is the administration of 1 grain of emetine daily for nine days. At Cuyamel in Spanish Honduras 75 patients who only got 3–6 days' treatment all relapsed without exception. The administration of emetine should not be continued longer than 2–4 weeks, otherwise intestinal irritation will be induced which aggravates the dysenteric condition. The greatest number of cures are obtained when no laxatives are given. The ill effects of the drug are seen after prolonged treatment rather than with large doses. The plan of treatment Barlow considers best is as follows:—

"One grain (or more, for one or two days) is given daily for 15 days, followed by 60–80 grains of ipecac for from 5–20 days, according to whether intestinal irritation is produced or not. The bowels are cleansed by a saline at the beginning of treatment, and about every five days. If there is either diarrhea or colic, it is checked by opiates, usually paregoric, in small repeated doses, until comfort is obtained. . . . On discharge the patient is instructed to return once each month for examination of a fresh stool obtained after a saline cathartic. If either endamebas (of any variety) or cysts of *Endamoeba histolytica* are found, the treatment is repeated."

E. E. Atkin.

LOW (George C.). **The Treatment of Amoebic Dysentery.**—*Brit. Med. Jl.* 1915. Nov. 13. pp. 714–716.

This paper comes from the Seamen's Hospital which is attached to the London School of Tropical Medicine, where considerable experience has been accumulated.

Dysentery may be bacillary, protozoal, or helminthic. The vast majority of the cases which have come to England from the Dardanelles are not amoebic. If blood and mucus are being passed while active amoebae are present in the stools, the case should be treated as amoebic dysentery. Later on when the case becomes chronic, cysts make their appearance, and *E. coli* may be excluded by its larger size and increased number of nuclei. *Intravenous* injections of emetine should be given when time is important. In chronic cases, when it is not necessary

for the patient to be in bed, the drug may be given in keratin capsules by the mouth. Methyl emetine (Burroughs Wellcome & Co.) does not seem to be more efficient than the hydrochloride, but was only tried in a few cases. Severe cases should receive 1 grain subcutaneous or intramuscular injections, morning and evening for two or three days; afterwards 1 grain every night until 12 grains in all have been given. One may begin with single daily doses in less severe cases. This will speedily relieve the symptoms. If blood and mucus recur, a second course of treatment, consisting of grain injections every night for six nights, is administered. A third course is practically never necessary. A case treated by the author is referred to in which disappearance of the cysts was brought about by a course of emetine. Chronic cases and carriers should be treated in the same way as acute cases. Emetine works wonderfully in cases of liver abscess, often causing complete abortion of all the symptoms. There is a small residuum of cases which for some unknown reason are refractory to emetine.

[Some French authors report success with salvarsan when emetine has failed.]

E. E. A.

Low (George C.). **Two Chronic Amoebic Dysentery Carriers treated by Emetine, with some Remarks on the Treatment of Lamblia, Blastocystis and E. coli Infections.**—*Jl. Trop. Med. & Hyg.* 1916. Feb. 1. Vol. 19. No. 3. pp. 29–34.

Cryptic infections with *E. histolytica* are often difficult to diagnose and a differential leucocyte count is recommended by CHALMERS and ARCHIBALD as an important help [this *Bulletin*, vol. 6, p. 444]. An increase in the number of large mononuclears and an eosinophilia are found. Low is inclined to discount the value of these adjuncts to diagnosis because the cases are frequently complicated by malaria and helminthiasis. In addition some of the cases show no abnormality of the blood.

The amoebic carrier is a dangerous person. The cysts he voids cannot resist drying, but live if they gain access to water or moist earth. In towns with good drainage there is probably little danger but an influx of amoebic carriers is a considerable menace to a rural district. It seems definite that people who have never left this country can become infected and develop the acute disease. A case of liver abscess has been described. The question of curing these carriers is therefore all important. Low reports the effect of treating two amoebic carriers with emetine. In the first case it was quickly effective and no return of the cysts was observed during a period of over seven months. The other case was hardly benefited at all by the treatment at first, but the cysts disappeared after a fortnight's administration of the drug.

It is now becoming recognised that *Lamblia intestinalis* may cause diarrhoea. Of the drugs that were tried Betanaphthol was ineffectual; methylene blue appeared to diminish the number of cysts but had to be stopped because the patient showed symptoms of poisoning; emetine was useless; kerol appeared to have no effect.

Blastocystis hominis is not known to be pathogenic. It is difficult to get rid of by drugs.

Entamoeba coli is usually looked upon as a harmless parasite but Low thinks that under certain conditions it may cause diarrhoea. Emetine produced only temporary disappearance of the parasite.

E. E. A.

BAYMA (Theodoro). **L'Adrénaline dans la Dysenterie Amibienne.** [Also in Portuguese].—*Ann. Paulistas de Med. e Cirurg.* 1915. July. Vol. 5. No 1. 16 pp.

The results of the treatment of 10 cases of amoebic dysentery with adrenalin are recorded from Sao Paulo, Brazil. The symptoms abated in periods of time varying from six hours to four or five days after the treatment was started. A chronic case of eight months' standing, in which emetine had not effected a cure, was enabled to go back to work after 10 days' treatment with adrenalin. Another case which had lasted more than three months was clinically cured after a few days, although amoebae were not eradicated from the stools. Only one of the patients had cysts and these were removed by giving three intestinal washes containing adrenalin at four day intervals. No toxic effects were observed from the use of the drug.

E. E. A.

HAMMACHER (J.). **De behandeling van Amoebendysenterie met onderhuidsche tannine-inspuitingen.** [The Treatment of Amoebic Dysentery with Subcutaneous Injections of Tannin.]—*Geneesk. Tijdschr. v. Ned. Ind.* 1915. Vol. 55. No. 5. pp. 550–560.

Owing to the high price and present scarcity of emetin, the author was led to try tannin as a substitute, as recommended by KARTULIS of Alexandria. A two per cent. solution was used, injected into the gluteal muscles, and at first, in consequence of KARTULIS' warning about pain and rise of temperature, the dose was limited to 1 cc. of the solution. It was, however, afterwards found that as much as 2 cc. could be used without harm, each dose thus containing 40 milligrammes of tannin. One injection was given daily for from five to seven days in succession, and the treatment was then stopped, the stools being examined daily for amoebae, and, if the result was negative for a week or more, the patient was regarded as cured, at any rate for the time being. The occasional presence of *Amoeba minuta* in the stools was disregarded, as being a harmless parasite. Out of 35 coolies who were thus treated for dysentery, 22 needed only one course of injections, while five required two or three series, and in the remaining eight cases, the treatment was begun with emetin and completed with tannin.

The author adds a note of warning against employing emetin in doses larger than 6 centigrammes. The exhibition of daily doses of 9 to 12 centigrammes in three cases of dysentery, one being his own, resulted in the production of a rather alarming feeling of weakness in the limbs, and he asks whether in these doses emetin is not capable of acting as a muscle or nerve poison.

J. B. Nias.

JOB (E.) & ERNOUL (I.). **Un cas de dysenterie amibienne autochtone.** —*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1915. Oct. 21. Vol. 31. 3 ser. No. 29–30. pp. 851–855.

This was a case of a French soldier with amoebic dysentery who did not get better on emetine. He received subcutaneous injections of 4 centigrammes of chlorhydrate of emetine to begin with, followed by 8 cgm. on three successive days, but he died on the day after the last dose.

The authors have experienced similar failures before, almost always in natives of Senegal whose intestines were infected with parasites such as Trichomonas, Lamblia and intestinal worms. Thymol is particularly appropriate in these cases in conjunction with emetine.

There is another point of interest in the case cited above. Although it was in hospital at Casablanca that the diagnosis was made, a place where amoebic dysentery is endemic, yet the man was admitted to hospital immediately on arriving at that port and his illness dated from the time when he was in the trenches in France. His regiment was a colonial one but he himself had never been abroad prior to his illness. He undoubtedly got his infection from his comrades, many of whom had been in places infested with amoebic dysentery and, although not ill themselves at the time, were carriers of the specific organism. The authors point out this is no danger to France in her colonial expansion. People who have had amoebic dysentery some time previously, on returning from France are often seized with diarrhoea at Tangiers, which becomes dysentery by the time they arrive at Casablanca. The climate is no doubt responsible for this.

E. E. A.

RENCUREL (J.-E.). **Note sur deux cas d'ictère et subictère prédysentériques.**—*Bull. Soc. Méd.-Chirurg. Indochine.* 1915. Mar. Vol. 6. No. 3. pp. 68–76.

Post-dysenteric jaundice is not uncommon, but this condition preceding the ordinary symptoms of amoebic dysentery is much more unusual. Two cases are reported.

Case 1.—Dysenteric stools appeared on the 15th day of the jaundice which was by this time decreasing. The only symptom which could be attributed to the jaundice was bradycardia. Unfortunately a microscopic examination could not be made and the only thing pointing to amoebic dysentery was the fact that the patient got well on emetine.

Case 2.—The patient complained of pain over the liver. Ten days later jaundice appeared. Although amoebae were not found in the stools he was put on to emetine. After about six days of this treatment he suddenly developed diarrhoea and microscopic examination revealed many amoebae, both active forms and cysts. The dysentery proved intractable and emetine had to be continued for 17 days before the patient was cured.

E. E. A.

ELLIOTT (John B.). **Abscess of the Liver.**—*Southern Med. Jl.* 1915. Dec. 1. Vol. 8. No. 12. pp. 1019–1026. With 3 text-figs.

A collection of 116 cases of liver abscess in which the diagnosis was confirmed, occurring in two hospitals in New Orleans. Of these 47 gave a definite history of dysentery, some recent, others many years ago. The large majority gave a history of pain in the region of the liver as the most prominent symptom, 73 recovered, 40 died and 3 deserted. The leucocytosis in 49 cases was on an average 18,000; the average neutrophil count in 59 cases was 79 per cent.

Definite amoebic infection was found in only 25 cases, but probably a careful search of all the cases would have brought it up to 80 per cent. The left lobe was involved in 10 cases. In 7 the abscess ruptured into the lung. All the seven positive cases of multiple abscess died. The most constant symptoms are pain in the liver region, loss of weight and leucocytosis.

E. E. A.

GAUDUCHEAU (A.). **Infection spirillaire d'amibes: pénétration des spirilles dans les kystes. Considérations sur la vie intracellulaire des bactéries.**—*Bull. Soc. Méd.-Chirurg. Indochine.* 1914. Oct. Vol. 5. No. 8. pp. 337–341, With 3 figs.

When cultivating *Entamoeba* (*Vahlkampfia*) *phagocytoides* on an almost immobile culture of *Bacillus coli*, the author found that some amoebae contained numerous small microbes showing active movements. These bacteria were considered by him to be in a state of true intracellular, parasitic life, in which condition they undergo modification, their mobility increasing and their dimensions decreasing. Similar bodies have been seen in leucocytes from stools of bacillary dysentery cases. The movements are not due to circulation of protoplasm, but originate in the minute bodies themselves.

Similar parasitism of amoebae by bacteria has been observed in the case of an amoeba, found naturally encysted in the intestine. Three monkeys infected with amoebae showing such hyperparasitism were found. Fresh preparations of the amoebae showed that the outer half of the organism was the principal seat of the swarming of the invading bacteria. The largest of these inclusions was the size of *B. coli* or an ordinary typhoid bacillus, the majority were smaller. Examination of isolated microörganisms near the walls of the cysts revealed the presence of some true spirilla. Certain of these retained their motility for 24 hours at a temperature of 30° C. to 32° C. The thickness of the intracystic spirilla is variable. Thick forms are large and less mobile. Thinner, more delicate ones appear to be the forms that initiate the intracellular evolution of the spirilla.

The author regards the intracellular bacteria and spirilla observed in the living condition within amoebae as being in a state of true parasitism, and thus being capable of producing disease in the amoebae. He suggests that it is one of nature's methods of destroying dysenteric amoebae. Intracellular stages of spirilla should be searched for in such cases of latent spirillosis.

H. B. F.

MACFIE (J. W. Scott). **A Case of Dysentery in a Monkey, in which Amoebae and Spirochaetes were found.**—*Ann. Trop. Med. & Parasit.* 1915. Dec. 30. Vol. 9. No. 4. pp. 507–512. With 1 plate.

A small monkey, *Cercopithecus petaurista*, in which a strain of a human trypanosome had been sent to Accra, died unexpectedly 65 days after inoculation. The monkey had suffered from diarrhoea. At autopsy the large intestine was found to be congested and studded with ulcers, which were most numerous near the caecum. In fresh preparations of the contents of the large intestine many active amoebae were seen. They usually measured 12μ to 15μ in diameter, but some reached 30μ and contained ingested red corpuscles. Cysts were also present which usually measured 12μ to 18μ in diameter, but some attained 33μ. The cysts had a thick wall and contained a large vacuole. The number of nuclei varied greatly but generally several were present, while in one cyst eight nuclei were counted. In sections amoebae were seen at the bases of the ulcers. The author compares the parasite with various other entamoebae described from monkeys which were usually healthy. He considers that the organism is different therefrom, and suggests the name *Entamoeba cercopitheci.*

Large numbers of minute spirochaetes were also seeen in smears of the contents of the large intestine and rectum of the same monkey. The spirochaetes were very slender and had pointed ends. They varied in length from 4μ to 7μ. In morphology they resembled *Spirochaeta eurygyrata* found by WERNER in 1909 in healthy human faeces. The present author has also seen similar parasites in enormous numbers in the faeces of two patients at Accra who were suffering from diarrhoeic symptoms.

H. B. F.

ESCOMEL (E.). **A propos d'un phénomène biologique de l'amibe dysentérique.**—*Bull. Soc. Path. Exot.* 1915. Oct. Vol. 8. No. 8. pp. 573–574.

The author shows that *Entamoeba histolytica* will not engorge the red corpuscles of a person taking emetine, but will readily engorge those of a normal person. Thus emetine is not only anti-haemorrhagic but also renders the red cells unpalatable to amoebae.

E. E. A.

SMITH (Allen J.) & BARRETT (M. T.). **Further Note upon Comparison of *Endamoeba gingivalis* (Gros) and *Endamoeba histolytica* Schaudinn.**—*Jl. of Parasitol.* 1915. Dec. Vol. 2. No. 2. pp. 54–56.

Endamoeba gingivalis possesses a nucleus which is almost invisible in the fresh state. It also exhibits the "throwing off of gemmules by actively moving and apparently normal amoebae," and the authors incline to the view that the gemmules are not degenerate [cf. SCHAUDINN's account of the development of *E. histolytica*]. They also believe that *E. gingivalis* is distinct from *E. histolytica* because of the "constant failure of attempts to infest the colon with pyorrhea material rich in *Endamoeba gingivalis*." The pyorrhea material

contained active vegetative amoebae and was administered to two kittens by feeding, to two puppies and to two kittens by high rectal enemata, and to four kittens by injection into the colon after laparotomy. *E. gingivalis* is stated to be more haemolytic than *E. histolytica* as well as presenting slight morphological differences such as somewhat smaller size, more lobose pseudopodia and more central nucleus.

H. B. F.

i. WILLIAMS (Anna Wessels), von SHOLLY (Anna I.), & ROSENBERG (Caroline). **Amoebas in the Mouths of School Children.**—*Proc. New York Path. Soc.* 1915. Mar. N. Ser. Vol. 15. No. 3. pp. 34–37.

ii. WILLIAMS (Anna Wessels), von SHOLLY (Anna I.), ROSENBERG (Caroline), & MANN (Alice G.). **Significance and Prevention of Amebic Infections in the Mouths of Children.**—*Jl. Amer. Med. Assoc.* 1915. Dec. 11. Vol. 65. No. 24. pp. 2070–2073.

i. The authors point out that it is necessary to seek for early cases of oral amoebiasis. Accordingly, 475 school children between the ages of 9 and 16 years were examined, and 150 representative cases were chosen for further investigation. Two smears were usually taken from each case. In bad cases, the teeth and gums were cleaned with a cotton swab dipped in 50 per cent. alcohol, then with the flat end of a sterile toothpick material was scraped from the margin of the gums, and smeared over a clean glass slide. The preparation was fixed wet with methyl alcohol and sent to the laboratory. This was called the superficial smear. A second smear was made from material obtained from beneath the margin of the gums, and similarly fixed. This was called the deep smear. All the preparations were stained with Giemsa's solution. The amoebae were often found to contain masses of undigested material, such as leucocytes, red blood corpuscles and bacteria.

Thirty per cent. of the children showing healthy gums were found to be infected with amoebae. Fifty per cent. of those with healthy gums but decayed teeth showed amoebae. Eighty-four per cent. of those with tartar and receding gums contained amoebae, and 94 per cent. of those with spongy and bleeding gums. The authors point out that most of the cases of spongy and bleeding gums show more amoebae in the smears than the other cases. It is proposed to test the effects of ipecacuanha and emetine in the form of tooth washes.

In a discussion that followed the reading of this paper, it was doubted whether pyorrhoea alveolaris was directly due to Endamoebae. Spirochaetes were found in most of the mouths examined.

ii. After discussing the various hypotheses in regard to the action of amoebae in the human mouth, the authors give a further account of their own researches. Out of 1,678 school children examined between the ages of 5 and 15 years, 995 representative cases were taken, and stained smears from their mouths were made and examined for amoebae. The parasitic organisms seemed to be most numerous between the superficial bacterial layer and the deep leucocytic layer.

There appeared to be

"at least two morphologic types of amebas present: one small, with more or less rounded, dense nucleus, with a few or no inclusions or vacuoles, found in the majority of healthy mouths, and the other large, with more irregular nucleus with many large vacuoles and containing many red blood cells, leukocytes and other dense masses formed by undigested material. The latter type is found in the majority of unhealthy mouths. Its appearance agrees with that of the type most frequently seen in the well-developed cases of pyorrhoea alveolaris. We have seen no cysts. We have seen evidence of budding and of more equal division."

Infection begins at an early age, 35 per cent. of children between 5 and 7 years of age being infected. The numbers of those infected increase in frequency with age. Between 5 and 15 years, 60 per cent. are infected. In apparently normal mouths only 29 per cent. show amoebae. The numbers and percentages of amoebae found in groups of children are shown in the following table:—

NUMBER AND PERCENTAGE OF AMEBAS FOUND IN EACH GROUP OF CHILDREN.

Condition of Mouth.	Between 5 and 16 years.		Between 5 and 7 years.	
	Total.	Amebas present.	Total	Amebas present.
1. Healthy gums ..	(+ 38) (— 92)	= 29 per cent.	(+ 3) (— 31)	= 9 per cent.
2. Healthy gums, decayed teeth ..	(+ 109) (— 183)	= 37 per cent.	(+ 32) (— 105)	= 23 per cent.
3. Tartar and receding gums	(+ 182) (— 96)	= 65 per cent.	(+ 19) (— 17)	= 53 per cent.
4. Spongy, bleeding gums	(+ 268) (— 28)	= 91 per cent.	(+ 34) (— 5)	= 70 per cent.

The authors have divided the cases showing amoebae into three groups, "one to be watched without treatment, and others to be treated in different ways, one with emetin and the other by ordinary cleanliness." The results obtained are stated thus:—"With ordinary teeth cleansing methods, the number of mouths showing amebas is reduced one half. With emetin in the tooth wash, the number showing amebas is greatly reduced, only about 10 per cent. showing them. The second set of controls—those doing their cleaning *at home* by ordinary methods—continue to show amebas in about 75 per cent. of the cases." The strength of emetin solution has not yet been settled, 1 in 200 and 1 in 400 having been tried.

It is stated that:—"Amebas are demonstrated irregularly in all mouths once showing them, most constantly and in largest numbers in mouths showing gingivitis, least so in healthy mouths."

In the subsequent discussion Dr. C. C. BASS stated that the oral endamoebae fed on certain nucleated cells that were to be found only in inflamed tissues. The endamoebae were observed burrowing in the inflamed tissue.

H. B. F.

LYNCH (Kenneth M.). **Concerning Endamebiasis of the Mouth.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. Oct. Vol. 3. No. 4. pp. 231–242.

The author reviews the work of previous observers on oral endamoebiasis (Riggs' disease) due to *Endamoeba gingivalis.* Simple smears from the gum edges were made and stained with Wright's or Leishman's stains. The alveolodental periosteum and the mucous membrane of the gums are infected by the Endamoebae, and injury to the dental membrane is a factor, but the author considers uncleanliness more important. Endamoebiasis of the mouth is divided into :—

1. Amoebae present, with no resulting disease. Such occurred in the case of two toothless old women.

2. Microscopic pyorrhoea alveolaris, wherein small amounts of white granular material occur beneath the margins, in the obtaining of which the tissues bleed more easily than normal. In this material amoebae are found. Inject ½ grain of emetine hydrochloride daily till no more amoebae are found.

3. Early chronic pyorrhoea, recognisable grossly, with gradual destruction of the peridental membranes and a chronic catarrh of the gum margins. Five to eight days' treatment with emetine hypodermically should suffice.

4. Late pyorrhoea alveolaris, wherein pus pockets and sinuses are produced. Local injection of the sinuses with ½ per cent. solution of emetine hydrochloride as well as hypodermic administration is carried out. The amoebae encyst in undrained cavities. Surgical procedure may be necessary.

5. Chronic pyorrhoea with general acute catarrhal stomatitis. In one case, amoebae were found in material from the tongue and other surfaces.

6. Chronic pyorrhoea with complicating infections. Trichomonas may be present, and has to be eliminated by alkaline washes before the endamoebae will respond to emetine.

7. Acute pyorrhoea alveolaris—with general involvement of the gum margins.

8. Endamoebae in aphthous and ulcerative stomatitis—a case with history of ulceration of the mouth for 15 years.

9. Amoebae in glossitis—six cases with sore tongues ; amoebae were obtained from the open surfaces.

Prevention—that is, care of the mouth and teeth—is important, and early recognition and treatment of the disease with emetine. The author does not favour the use of ipecac mouth washes. The necessity for coöperation with an oral surgeon must be recognised.

H. B. F.

CRAIG (Charles F.). **Observations upon the Endamebae of the Mouth. I.** *Endamoeba gingivalis* (*buccalis*).—*Jl. Infect. Dis.* 1916. Feb. Vol. 18. No. 2. pp 220–238. With 1 plate.

This paper is both interesting and critical. The author believes that *Endamoeba gingivalis* Gros is identical with *Endamoeba buccalis* Prowazek. He has found a new parasite in the human mouth which he calls *Endamoeba confusa,* characterised by its small size, details of

which will be published later. It is considered probable that each of these organisms together with *E. histolytica*, *E. coli*, and *Vahlkampfia* sp. may occur in the human mouth. An historical survey of earlier work on oral amoebae is given, in which it is noted that CHIAVARO (1914) was the first to describe encysted forms of *E. gingivalis*. The parasite is stated to have a world wide distribution. A detailed account is given of its morphology. Trophic, pre-cystic and cystic stages are described. Multiplication occurs by simple division during the first stage and is absent during the second. No development is said to occur in the cysts, as only uninucleate forms have been seen, and these are considered to be resistance cysts. Trophic forms vary in size from 7μ to 35μ in diameter. The pseudopodia vary much in shape and, in the living condition, the nucleus is usually invisible. The organism is actively phagocytic. The author has observed a process which he regards as conjugation, two endamoebae becoming united and interchanging cytoplasmic material, after which separation occurs. Budding or gemmation has been seen, which process is considered to be degenerative. The precystic forms are reduced in size, the average diameter being about 10μ to 12μ, the nucleus more marked and the organism almost non-motile. The cysts usually measure from 8μ to 10μ. in diameter. The pre-cystic and cystic forms of *E. gingivalis* are rare. In stained specimens the nucleus of *E. gingivalis* is stated to be smaller than that of *E. histolytica* in the histolytica phase, and to possess a thicker nuclear membrane and a larger karyosome. The frequent occurrence of oval or round bodies within the trophozoite is very characteristic, and is of some diagnostic value in this species. Neither rectal injection nor feeding of material containing *E. gingivalis* gives rise to diarrhoea or dysentery in animals.

The author states that "it is more than doubtful that *Endamoeba gingivalis* is the cause of pyorrhoea alveolaris, and that it is yet too early to make positive statements regarding the relationship of this parasite to disease." Regarding the treatment with emetine of patients suffering from this disease, he found that "while the endamebae generally decrease in number during its administration, careful search will show motile and apparently healthy endamebae in the lesions throughout the period of administration." The author has found that "spirochaetes are present in immense number" in all cases of pyorrhoea alveolaris and emetine appears to have some action on them, as they certainly lessen in number under treatment. It is noted that cases of severe typical pyorrhoea are known in which endamoebae could not be demonstrated.

The various stages of *E. gingivalis* are illustrated in a plate of 12 figures.

H. B. F.

JOHNS (Foster M.), **A Study of *Endameba buccalis* in Alveolodental Pyorrhoea.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1916. Jan. Vol. 3. No. 7. pp. 372–376.

Alveolodental pyorrhoea begins "with some trauma, or food-pressure necrosis, divesting the peridental membrane of its covering mucosa, [and] it very slowly extends by an ulcerative process down, or around, the root of the tooth. Peridental membrane consists essentially of connective tissue fibres running from the alveolar wall to the

cementum of the tooth root." Sloughing ensues and a pocket is produced around the base of the tooth. Careful scrapings from the bottom of a pocket show pus cells, red cells, tissue cells and connective tissue fibres, accompanied by *Endamoeba buccalis* and a number of bacteria. The Endamoebae rarely occur in the pus from pyorrhoea pockets, but the pus may contain spirochaetes.

The Endamoebae transport masses of adherent bacteria. The protozoal parasites feed principally on large nucleated cells. They multiply by binary fission and were not observed to undergo either schizogony or encystment. Sections of lesions "show endamebae in large numbers bordering upon, and occasionally penetrating, the area of chronic inflammation just beneath the surface of acute suppuration." It is possible that the Endamoebae alone are not entirely responsible for the production of the lesions. "Probably the opening of avenues of infection, or the direct transportation and constant replanting of adherent bacteria into and about the granulation tissue elements, constitute a very important factor in the production of the lesion."

Regarding the action of emetine hydrochloride, the author concludes that "it is possible that the harmful action of emetine towards parasitic endamebae is achieved indirectly by altering one of the necessary factors to the continued growth of the endamebae in the lesion."

H. B. F.

LYNCH (Kenneth M.). **An Ameba in Suppurative and Hyperplastic Osteoperiostitis of Inferior Maxilla.**—*Jl. Amer. Med. Assoc.* 1915. Dec. 11. Vol. 65. No. 24. p. 2077.

The author has found amoeboid cells in the pus from the left half of a diseased mandible taken from a negro woman in the Roper Hospital, Charleston, South Carolina. The case was diagnosed as osteosarcoma.

"The bone was thick, with rough surface into which ran small clean-cut sinuses containing thick white granular pus." There was a prominent portion about the middle of the bone, over which was a hard fibrous mass like a tumour. The first molar tooth was missing, and the third was represented by a decayed root. Microscopically the tumourous mass appeared to be that of an "inflammatory growth of bone and connective tissue of a progressive nature, showing areas of necrosis and pus formation corresponding to the previously mentioned sinuses."

No bacteria were found in the pus, which contained granular materials, neutrophile leucocytes, eosinophiles, some recognisable tissue cells, and numerous amoeboid cells. These latter when rounded were 40μ in diameter, had clear ectoplasm and coarsely granular endoplasm. No nucleus was recognisable either in the fresh state or when fixed and stained. Large, broad, single pseudopodia were formed, which engulfed red blood corpuscles and leucocytes. Unfortunately, the specimens were destroyed before complete examination had been made.

The author considers the amoeboid bodies to be parasitic amoebae. different from any previously described. He does not know whether these amoeboid cells were the etiologic factor of the tumour or not. but suggests that they may have been.

[From the description given, the protozoal nature of the amoeboid bodies observed is not yet proven.]

H. B. F.

HOXIE (George Howard). **Pyorrhoea due to Organisms other than the Amebas.**—*Jl. Amer. Med. Assoc.* 1915. Nov. 27. Vol. 65. No. 22. pp. 1908–1909.

The author considers that Endamoebae are not the cause of all the cases diagnosed as pyorrhoea alveolaris. A case is described. There was a recurrent fever of about 17 days' duration, as well as knee pains. Cultures from necrotic plugs showed species of Aspergillus, while smears showed diplococci. Vaccines were administered.

H. B. F.

EVANS (J. S.), MIDDLETON (Wm. S.) & SMITH (Allen J.). **Tonsillar Endamebiasis and Thyroid Disturbances.**—*Amer. Jl. Med. Sci.* 1916. Feb. Vol. 151. No. 2. No. 527. pp. 210–222.

This interesting paper begins with a survey of the various forms of goitre and their possible causative agents and excitants. Among others, the works of MCCARRISON, FARRANT and CHAGAS are referred to. The present investigation began with a statistical study of endemic goitre in Wisconsin, especially among university students. Wisconsin is situated in a goitre belt in a glacier zone. From 34 goitre subjects with chronic cryptic tonsillitis the following organisms and structures were found in material aspirated from the pouting crypts :—*Endamoeba gingivalis*, myriads of bacteria, spirilla, numerous granular leucocytes (pus cells), erythrocytes and a few epithelial cells. The authors think

"that the essential toxic factors are really the products of the bacteria associated with the amebae, and that these bacteria are the variants and the amebae are the constants in many varying infections of the mouth, tonsils, and the nasal passages and sinuses, that there is a symbiotic relation between the protozoa and the bacteria, the amebae by proteolysis of various cells producing a pabulum of special value for the nutrition and growth of the bacteria, and the bacteria being constantly ingested and digested by the amebae, that as one particular form of bacteria is prominently present its toxin is liberated in prominent amount when the bacterial cells are thus digested, and that if that toxin has selective stimulative effect upon the thyroid elements, thyroid hyperplasia will follow."

The results of treatment with emetine hydrochloride are thus commented upon :—

"The reduction noted in the goitre mass, as well as the amelioration of the dysthyroidic symptoms, is the result of the removal by emetin of the amebae demonstrated in the tonsillar crypts in these cases, this resulting in a breaking of an important symbiotic chain of endamebae and thyrotoxic bacteria, and removing thereby from these foci the active elaboration of the directly influential toxins."

This represents the authors' belief, but absolute proof is lacking.

The conclusions are as follows : –

"1. Tonsillar lesions of an infective cryptic character were found in 22·8 per cent. ; and nasal together with tonsillar lesions existed in 90 per cent. of 362 goitrous individuals examined from this standpoint.

"2. In typically diseased tonsils, out of 34 cases examined microscopically, 97 per cent. were found to harbour *Endameba gingivalis* (Gros) in the tonsillar crypts.

"3. Of 16 individuals of this group who after treatment by means of emetin hydrochloride were re-examined, 13, or 81 per cent. were shown to no longer have endamebae in the cryptal contents.

"4. In 23 individuals to whom emetin was administered a reduction in the bulk of the goitre was appreciable in 18 individuals, and of 7 dysthyroid cases included in this group of treated cases 6 were benefitted in degrees varying from slight amelioration to apparent cure.

"5. Inability to demonstrate endamebae in the thyroid gland renders improbable any direct causal relation of the amebic infestment of the tonsils *per se* upon the development of thyroid disturbances.

"6. However, the improvement, morphologically and symptomatically, in the treated cases leaves little doubt, after ruling out a vasomotor influence from the emetin employed, as to an indirect relationship. A symbiosis of endamebae with appropriate bacteria leading to the elaboration and absorption into the thyroid of selective thyrotoxic poisons, is at least conceivable in explanation of such relation.

"7. In no sense do the writers care to be understood as advancing hereby an exclusive explanation for all goitres; other types and other locations of infections capable of producing thyrotoxic toxins, perhaps, too, toxic substances having a similar influence but derived from metabolic or alimentary fault, or even entering the body from without, are all of possible influence; nor is the influence of sympathetic stimulation, however accomplished, to be overlooked. The writers are unable to follow, moreover, in any of these lines of thought, into any satisfactory explanation of the known occurrence of belts of endemic goitre along certain well-defined glacier drifts."

H. B. F.

Bacillary Dysentery.

Kruse (W.). **Die Ruhr in Krieg und Frieden.** [Dysentery in War and Peace.]—*Deut. Med. Woch.* 1915. Sept. 2. Vol. 41. No. 36. pp. 1057–1059.

Although this is a paper of a general nature devoid of clinical data, the views expressed must claim attention since the author's name has been linked with that of Shiga as the co-discoverer of the type of dysentery bacillus bearing their joint names.

After a short historical introduction he goes on to say that the dysentery in the German army to-day is entirely bacillary, and the cases are mild. Bacilli are classed as true dysentery (Shiga-Kruse), and pseudo-dysentery including all the other types. Pseudo-dysentery is the milder variety and is characterised by absence of tenesmus, and blood in the motions. It is less dangerous, and is the type endemic in asylums. It is met with also in children and termed "enteritis follicularis." It is the preponderating variety of dysentery in this war, a quarter only of the cases being true dysentery. The death rate is only a fraction per cent. even in military hospitals, whereas that of true dysentery in times of peace reaches about 3 per cent. taking the same age classes. Kruse divides pseudo-dysentery bacilli into types A, B, C, etc., and considers the grouping as Flexner and Y types, according as maltose is or is not fermented, as wholly artificial and not conforming to any natural classes. The power to ferment this sugar is unstable and by using it as a criterion we class together varieties which are really distinct, and separate others which are closely allied.

With regard to the diagnosis of the two kinds of dysentery, a rule which is usually valid is that if the patient's serum agglutinates the

Shiga-Kruse bacillus in at least a 1 : 50 dilution, the case is one of true dysentery; if there is no agglutination with this bacillus, we have to deal with pseudo-dysentery. The value of agglutination in the case of pseudo-dysentery is discounted by the fact that the bacilli are often agglutinated by normal blood, to say nothing of the blood of true dysentery and typhoid cases.

Immunisation against true dysentery up to the present has not been very successful. Active immunisation with dead bacilli leads to very marked local and general disturbances. The author has experimented upon himself without much success. On the other hand passive immunisation is quite practicable, as a potent immune serum can be prepared. It is however not much use in war-time since the protection conveyed is but short-lived while the exposure to infection is practically constant.

E. E. A.

MATTHES (M.). **Zur Klinik der Bazillenruhr.** [Outbreak of Bacillary Dysentery.]—*München. Med. Woch.* 1915. Nov. 9. Vol. 62. No. 45. pp. 1545–1548.

An outbreak of diarrhoea occurred in one of the German armies. The cause was at first obscure. The cases were mild and the question of cold or inappropriate food suggested themselves as exciting factors. No pathogenic bacteria were isolated from the stools. Later on the cases were more severe and the disease spread to the personnel of the hospital. It was now evident the outbreak was of an infectious nature. After it had lasted three weeks the examination of perfectly fresh faeces from some of the cases disclosed the presence of *B. dysenteriae* Y; moreover on testing the serum of convalescents this same bacillus was agglutinated. The reason it was not found before may perhaps be explained by the fact that the original samples of faeces could not be examined for one or two days after they were passed.

Relapses were frequent and often worse than the initial attack. In addition to the diarrhoea the clinical features of the disease worth noting were, absence of swelling of the spleen, slow pulse, slight leucocytosis (10,000 to 15,000) during the febrile attacks, and a positive diazo reaction. A relatively frequent complication was bronchitis and, in the bad cases, broncho-pneumonia.

The most important part of the treatment consisted in washing out the large gut. The patient was put in the knee-elbow position and a half per cent. solution of tannin injected until discomfort began to be felt. After evacuation this was repeated until 4–5 litres had been used. A miscellaneous assortment of drugs and applications was also employed, not requiring special mention. The fatality was at most a half per cent. There were practically no sequelae. Although these cases were all due to the same cause the character of the motions was markedly different in the individual cases. Some were foul smelling with evidence of much fermentation; others contained blood and mucus.

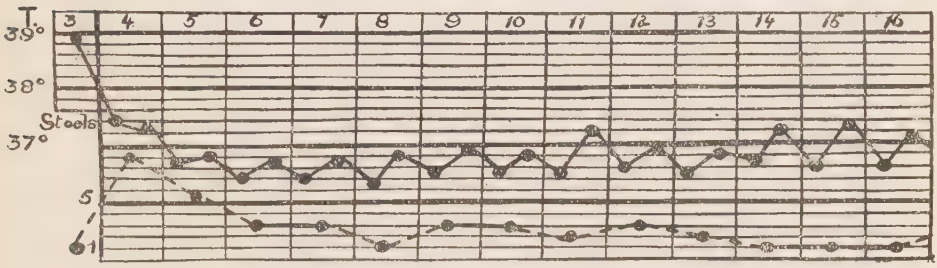
In a footnote the author remarks that the cases he saw subsequently in the autumn were considerably more severe than those described above, which were observed in the spring. The bacteriologists found for the most part Flexner and Shiga-Kruse bacilli. Good results

followed the intravenous or intramuscular injection of dysentery serum. Treatment with adrenalin was useless, but a new astringent compound of calcium and tannin was more efficient. [One is left in doubt as to the true relation of these last mentioned cases to those of the epidemic described in detail, and whether *B. dysenteriae* Shiga was not responsible for some of them also. It would also have been interesting to know what kind of dysentery serum was used and above all the agglutination reactions of the blood of these later cases.]

E. E. A.

KITTSTEINER (C.). **Erfahrungen über leichte Ruhrfälle.** [Experiences with Cases of Mild Dysentery.]—*München. Med. Woch.* 1915. Dec. 21. Vol. 62. No. 51. pp. 1766–1768. With 4 charts.

These remarks are based on 70 cases of clinically typical dysentery of the mild variety. Bacilli of the Flexner type were isolated from several of the cases. The author has observed a characteristic temperature curve for all these cases. The chart reproduced below is the average of six separate temperatures.



Curves of Temperature and Stools.
Average of six Cases.

It will be noticed that after a rapid fall on about the third day of the illness the temperature remains normal or sub-normal until the 11th day when a slight rise occurs. There is another fall on the 12th day followed by a small increase on the evening of the 14th day. The subnormal morning temperatures are also a striking feature. A relation between the number of stools and the temperature does not exist except at the very beginning.

A characteristic of the stools is that they display marked fermentation, which indicates that carbohydrate digestion is interfered with. The small intestine is therefore involved as well as the large. By giving a carbohydrate-free diet the fermentation ceases and fluctuations of temperature are minimised. These symptoms are not fully developed before the second week.

With regard to treatment Bolus gave the best results. It is useless giving small doses—an effective dose is 100–300 grams. If the faeces become hard, the amount of bolus must be diminished. It is however useless in severe cases. Opium in large doses is a useful adjunct. Tannin rectal injections gave good results in obstinate cases, but those containing ichthyol were of no use. Atropin counteracted constipation when present. For the painful colic, adrenalin was given and acted usually in half an hour.

E. E. A.

JOB (E.). **Dysenterie bacillaire et infections à paratyphus B.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1915. Nov. 4. 3 ser. Vol. 31. No. 31–32. pp. 870–873. With 4 charts.

Four cases of bacillary dysentery are described, in the course of which *B. paratyphosus* B was isolated from the blood. In the first two the damage caused by the dysentery bacillus to the intestinal mucosa appears to have afforded an easy entry for the paratyphoid bacillus, which had hitherto been leading a saprophytic existence in the intestine. The patients were in hospital suffering from dysentery and were getting better, when suddenly a rise of temperature occurred, coincident doubtless with the invasion of paratyphoid bacilli.

The third case seems to have been a pure association of the two diseases. The dysenteric condition was improved by antidysentery serum.

The dysenteric factor of the last case seems to have been due to a bacillus other than the Shiga or Flexner types as the patient's serum agglutinated neither of these. E. E. A.

PENFOLD (W. J.). **Two Cases of Dysentery in Children due to *B. dysenteriae* of Flexner Type.**—*Brit. Med. Jl.* 1915. Nov. 13. p. 722.

The onset in the first case was with a high temperature (103·8°) and delirium. The patient, three and a half years old, was seized with vomiting, and passed green, watery motions at first which soon became slimy and contained a quantity of blood. On the second day the motions numbered over a dozen but the temperature was normal. Blood disappeared from the stools on the 4th day. By the 6th day the stools were normal again.

The second case was the infant sister of the first. There was neither fever nor delirium. Blood and mucus appeared in the motions but the disease was very much milder in this instance.

In both cases a bacillus which proved to be *B. dysenteriae* Flexner was isolated. They gave the usual fermentation reactions and were agglutinated to the full titer of a specific serum (1 : 2560). The serum of the first child agglutinated her own strain of bacillus in a dilution of 1 : 80 on the 4th day. E. E. A.

RENCUREL (J. E.). **De la fréquence du pouls comme élément de diagnostic de dysenterie bacillaire.**—*Bull. Soc. Méd.-Chirurg. Indochine.* 1915. Mar. Vol. 6. No. 3. pp. 77–88. With 7 charts.

Anti-dysentery serum (Dopter) is only of use when given quite early in the disease. Impressed with this fact, Rencurel sought for some symptoms which would enable him to make a rapid differential diagnosis between bacillary and amoebic dysentery. This he found in the frequence of the pulse which is much higher in the bacillary type of disease.

[As no bacteriological nor microscopic examinations were made to clinch his diagnoses, he cannot be said to have proved his point with certainty.] E. E. A.

RAUCH (Janina). **Ueber periostale Späterkrankungen nach Ruhr.** [Late Periosteal Lesions after Dysentery.]—*Med. Klinik.* 1915. June 13. Vol. 11. No. 24. pp. 672–673. With 2 text-figs.

The author records a set of four cases of periostitis in patients who had had dysentery. In one of them *B. dysenteriae* Shiga was still present and the serum gave an agglutination (1 : 300). The condition closely resembled a post-typhoid periostitis. The front of the tibia was the site of election and in one case the fibula was also involved. The periosteum was felt to be thickened on palpation, and the lesion could be detected by skiagram. There was pain on pressure and when walking, but it was usually absent when the patient was in bed. A typhoidal origin was of course excluded in these cases.

E. E. A.

SCHLESINGER (Hermann). **Dysenterische Polyneuritis bei Kriegsteilnehmern.** [Dysenteric Polyneuritis in Soldiers.]—*Med. Klinik.* 1915. Apr. 4. Vol. 11. No. 14. pp. 383–385.

A careful examination of what appeared to be rheumatic pains in soldiers, showed that they were in reality polyneuritis. Enquiry elicited the fact that they had previously suffered from frequent stools with blood and tenesmus, suggesting dysentery. The author also saw neuritis in some dysentery cases under his observation. The myalgia frequently observed after dysentery is probably neuritis. It is questionable whether it is commoner after the Flexner or Shiga type of dysentery, since the bacilli could not be isolated from the motions.

Symptoms.—Pains in legs. Feeling of deadness in fingers and toes. Increased sensitiveness to heat and cold in hands and feet. The nerve trunks of the arms and legs are sensitive to pressure. The muscles of the calf and thigh are painful when pinched. Anaesthesia is observed most often in the legs. Motor nerve disturbances were almost non-existent. All that was noticed was slight paresis of legs and arms, obliging the patients to use a stick when walking. The electrical reactions, in those cases which were tested, were normal. The knee-jerks disappeared in some instances but always returned in a few weeks. The whole course of the disease lasted only a few weeks.

Therapy.—This consisted of a rest cure with warm baths and salicylates.

[It is to be regretted that agglutinations were not done in these cases. If experiments on rabbits are any guide, these cases were probably caused by *B. dysenteriae* Shiga as this type produces severe paralysis in these animals in anything but the smallest doses, whereas the Flexner type does not produce lesions of the nervous system.]

E. E. A.

OPPENHEIM (R.). **L'insuffisance surrénale dans la dysenterie bacillaire et les entérites graves.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1915. Dec. 16. 3 ser. 31 Ann. Nos. 37–38. pp. 1155–1168.

Two cases are first described. The first had abnormal dysenteric stools—that is to say, neither blood nor mucus was present. There was marked arterial hypotension, indicating suprarenal gland insufficiency. Although the case was not seen until late adrenalin

was given, but death ensued. At the autopsy dysenteric ulceration was found, and haemorrhagic foci, some of them large, were present in both suprarenal glands. The second case resembled the first, but had blood and mucus in the stools. The same lesions were found post-mortem.

The number of cases of diarrhoea treated in the hospital was 657, of which 96 showed the dysenteric syndrome. On account of lack of the means for carrying out bacteriological examinations it is impossible to say how many of these were true dysentery. It is now known that dysentery bacilli do not always give rise to blood and mucus in the stools and inversely that stools containing the latter are not necessarily associated with dysentery. There were no deaths at all among these cases of enteritis with the exception of the two noted above, which were only seen by the author quite late in the course of the disease. These good results are ascribed to the early use of anti-dysentery serum and in large part also to the administration of adrenalin. In all the severe cases there was evidence of suprarenal insufficiency, four grades of which can be distinguished.

(1). *Super-acute*, to which the two cases referred to above belong.

(2). *Acute.* Irrespective of the intensity of the intestinal symptoms the patient exhibits a state of depression and extreme prostration from the first. He is generally emaciated and shows in a more or less marked degree the peritoneal facies. Speaking or moving appears to cost him a great effort. Vomiting is often observed. There is abdominal tenderness not only in the region of the colon, but also in the epigastrium and the whole area supplied by the solar plexus. The abdominal pains are accompanied by pains in the lumbar region analogous to those observed in Addison's disease. The pulse is rapid and small with a very low tension. Some of these symptoms, namely, arterial hypotension, acceleration of the pulse, collapse and often subnormal temperature suggest myocarditis, and the differential diagnosis may be difficult but the abdominal pains, the depression and pallor should make the diagnosis clear. The administration of adrenalin will also help to settle the matter since, although it exerts a tonic effect on the myocardium in all cases where the latter is affected, yet we never see such marvellous results as when the heart affection is secondary to disease of the suprarenal glands.

(3). *Subacute* in which the suprarenal symptoms do not dominate the condition as in (1) and (2), but allow the intestinal symptoms to become the most prominent feature. The suprarenal syndrome is present nevertheless and the patient is benefitted greatly by adrenalin.

(4). *Mild.* In a still milder form of the disease two signs of suprarenal trouble alone remain—prostration and arterial hypotension.

E. E. A.

PARHON (C. J.). **L'Adrénaline dans le traitement de la dysenterie. A propos de la communication de MM. Remlinger et Dumas.***—*C. R. Soc. Biol.* 1915. Nov. 5. Vol. 78.. No. 16. pp. 527–529.

The author cites 12 cases of dysentery which underwent no specific treatment as no anti-dysentery serum was available. They are

*See this *Bulletin*, Vol. 6, p. 460.

divided into two groups of six. The first six all died. The most striking symptoms were collapse and low arterial tension, which suggested the use of adrenalin. This drug was tried in the second group. Unfortunately in two of the cases it was not given until late in the course of the infection, with the result that they both succumbed. The other four cases however were treated from the very beginning, and all recovered. [There is no mention upon what the diagnosis of dysentery depended in these cases. If true dysentery, they were presumably caused by *B. dysenteriae* Shiga in view of the high fatality.]

E. E. A.

ROGERS (Leonard). **Sensitized Shiga and Flexner Vaccines in the Treatment of Chronic Bacillary Dysentery.**—*Brit. Med. Jl.* 1916. Jan. 1. pp. 7–8.

After citing some failures from using ordinary Shiga vaccines in Calcutta, in which the patients' conditions were apparently aggravated, the author was led to try sensitized dysentery vaccines. Shiga and Flexner bacilli were sensitized with the Lister Institute's anti-dysentery serum [amount and technique unfortunately not stated], and administered in doses up to 100 millions. Two cases are reported to have received only temporary benefit. A case in which Flexner bacilli were found in the stools was treated with both Flexner and Shiga vaccines, receiving two doses of 50 and one dose of 100 millions at weekly intervals, because Rogers has seen greater benefit follow the injection of a Shiga vaccine in cases with Flexner bacilli in the faeces, than when a Flexner vaccine was used. This case was greatly improved but relapsed. Other instances of good results following the use of sensitised vaccines are given, including that of an Indian whose life, the author is convinced, was saved by a Shiga vaccine. It is quite likely the dose of vaccine could be increased beyond 100 millions with better results. It is pointed out that the cases dealt with here were intractable ones in which other methods of treatment had failed.

E. E. A.

STOERK (Erich). **Neuere Erfahrungen in der Behandlung der Ruhr und ähnlicher Dickdarmkatarrhe.** [New Experiences in the Treatment of Dysentery and Similar Affections.]—*Therap. Monatshefte.* 1915. Sept. Vol. 29. No. 9. pp. 505–511.

The author considers anti-Shiga dysentery serum good if used early in the disease. Anti-Flexner serum has not given good results. In a course of treatment, in addition to the administration of serum, the first thing to do is to clear the bowel of mucus as much as possible, by giving calomel. This should be followed by substances calculated to absorb the toxins in the intestine such as bolus alba (alumina), animal charcoal, etc. They must be given very liberally or else they will have no marked effect. Given alone, not less than 300 grams of bolus alba per diem should be administered. A convenient vehicle is hot tea. Stoerk has had very good results by combining two or three absorbing agents. Another drug which has given excellent results by the mouth is papaverin.

E. E. A.

BUJWID (Odo). **Ueber Dysenterieserum und dessen Anwendung zu prophylaktischen und therapeutischen Zwecken** [Prophylactic and Therapeutic Use of Dysentery Serum.]—*Med. Klinik.* 1915. Sept. 12. Vol. 11. No. 37. pp. 1027–1029.

At the outbreak of the war a dysentery epidemic was in progress in Cracow, chiefly Shiga in type. Anti-dysentery serum was tried on the cases. As a result of the experience gained it is claimed that this serum is as efficient as diphtheria antitoxin if it is given quite early in the disease.

The antiserum made in Cracow is obtained by giving horses living intravenous injections. Separate animals are treated with Shiga, Flexner, and some other strains of dysentery bacilli. Agglutinins are tested for, as it is assumed they run parallel with the other antibodies. The serum should have a titer of at least 1 : 3000 before it is used. Gradually increasing doses of living bacilli are introduced into the jugular vein with a few days interval until a considerable quantity—1½ to 2 agar plate cultures—can be easily tolerated, which usually takes two to three months. Many horses are very sensitive and should be discarded.

The agglutination titer of normal horse blood for Shiga is 1 : 120 to 1 : 200; for Flexner 1 : 200 to 1 : 400. E. E. A.

HEVER (Karl) & LUCKSCH (Franz). **Ueber Ruhrschutzimpfung.** [Immunisation against Dysentery.]—*Wien. Klin. Woch.* 1915. Oct. 21. Vol. 28. No. 42. pp. 1134–1135.

An epidemic of dysentery took place in a district on the borders of Galicia containing 5,000 civilians. The majority of the cases occurred in the hilly part of this district where the inhabitants numbered 800. There were 67 cases in all, with 13 deaths. Several micro-organisms were obtained from the faeces of the patients. The first was identical with Shiga culturally but agglutinated equally well in a Shiga serum and in a Flexner serum, at a 1 : 4,000 dilution. Another bacillus was agglutinated only by Flexner serum and culturally agreed with this organism. Other strains were isolated.

The patients were transferred to the hospital of the neighbouring town. A polyvalent vaccine was prepared and all the remaining population from 14 years of age upwards were inoculated—243 persons twice and 100 persons once. In order to take no risks all children from four years upwards living in the houses affected were injected with a polyvalent immune serum. From the date of these inoculations only four fresh cases occurred. The first, a mild case became ill a day after the first injection. Another case which was moderately severe fell ill six days after the first injection. The fourth case was an uninoculated adult who visited the town and this was a rather serious one. Since then (about one month ago) no fresh cases have been reported although they have occurred in neighbouring places. [The fact that an organism is agglutinated equally well by a Shiga and by a Flexner serum is inexplicable and points to an error of technique. The evidence that some protection has been produced by active immunisation in these cases is good. Information as to the strength of the vaccines would have been very welcome.]

E. E. A.

PRATT-JOHNSON (J.) & MILNE (A. J.). **Dysentery: A Preliminary Note on a Method of Combined Preventive Inoculation against Typhoid, the Para-Typhoids, and Bacillary Dysentery.**—*Med. Jl. of S. Africa.* 1915. Nov. Vol. 11. No. 4. pp. 66–67.

Combined Preventive Inoculation against Typhoid and Paratyphoid Fever and Bacillary Dysentery.—*Brit. Med. Jl.* 1916. Jan. 15. pp. 88–89.

Some 150 inoculations with sensitised mixed dysentery vaccine were performed. Equal amounts of Shiga, Flexner, Kruse, Hiss, and Russel strains were used and sensitised with polyvalent dysentery serum. By this means the local reaction is markedly reduced. The authors make no attempt to bring forward evidence to show that the patients were protected. One injection of the vaccine produced agglutinins for each bacillus, and this the authors seem to take as evidence of immunity, but the crucial test is whether the inoculated persons when exposed to infection will take the disease, which proof is here absent. E. E. A.

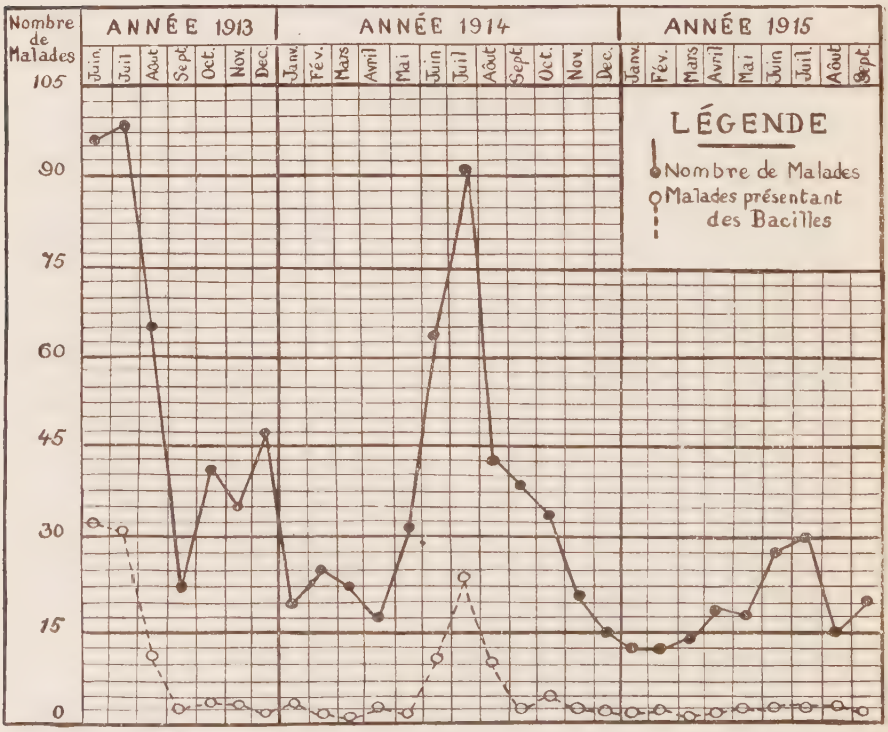
KUENEN (W. A.). **De bacillaire dysenterie en haar optreten in Deli.** [Bacillary Dysentery and its Occurrence in Deli.]—*Geneesk. Tijdschr. v. Ned. Ind.* 1915. Vol. 55. No. 3. pp. 203–342. With 9 diagrams.

The greater part of this very long memoir is taken up with a discussion of the subject of bacillary dysentery in general, presumably for the benefit of Dutch practitioners in the East Indies, who have no access to the literature of the subject. As will be seen from the index at the beginning, only some 15 pages or so of the paper have reference to local conditions. The scene of the author's personal investigations appears to have been a large tobacco plantation in Sumatra known as the Deli-Mij, where several thousands of Chinese and Japanese coolies are employed, and, like many other workers in a similar sphere of activity, the author has come to the conclusion that it is absolutely necessary to maintain a regular quarantine for detecting all kinds of chronic intestinal diseases in the case of immigrant workers from China and Japan. Expensive though such an arrangement may be, it seems to be repaid by results, and in this connection the author reproduces a chart [fig. 1] from W. SCHUEFFNER's *Tropenhygiene una ihre probleme* [see this *Bulletin*, Vol. 3, p. 394] in which it is shown that on a neighbouring tobacco estate, the Senembah-Mij, the mortality among a large body of coolies was reduced, during the years between 1890 and 1911, to 11·5 per 1,000 per annum from 74 per 1,000 per annum, at which it had previously stood, mainly as the result of hygienic measures and diagnostic precautions. More recently, at the Deli-Mij, the author shows that, for the seven years comprised between 1907 and 1913, amoebic and bacillary dysentery conjointly were responsible for, roughly, 400 deaths (bacillary 165, amoebic 133) out of every 1,000, among Chinese, Javanese and Klingali coolies, so that much still remains to be done in this connection in the way of prophylaxis and the cure of these diseases. Bacillus-Y dysentery the author finds to be much more prevalent than the Flexner and Shiga-Kruse forms, and its fatality seems to be greater than is generally supposed.

The present memoir may be usefully read in connection with SCHUEFFNER's brochure above mentioned. J. B. N.

DENIER (A.). **La dysenterie bacillaire à Saïgon.**—*Bull. Soc. Path. Exot.* 1915. Dec. 8. Vol. 8. No. 10. pp. 720–725. With 1 chart.

Dysentery at Saïgon in French Cochin China is due to similar causes to that occurring elsewhere. From June 1913 to September 1915 the cases were bacteriologically examined. In 1912 severe dysentery raged at Saïgon, which was somewhat mitigated in the next year. During 1914 and 1915 a diminution in virulence took place. Perhaps this may be attributed chiefly to the use of emetine, but probably also to a decrease in the numbers of the standing army and replacement by reserves, who were only in barracks for a limited period. The cases as a rule were only examined once. All sorts of intestinal disorders producing diarrhoea were included amounting to 1,009 cases. Dysentery bacilli were found 175 times, associated in nearly half of the cases with amoebae, and exceptionally with other types of dysentery bacilli.



As the chart shows, the greatest number of cases of intestinal infection occurred each year in July and practically the same is true for the number of cases yielding dysentery bacilli. This is coincident with the beginning of the rainy season.

E. E. A.

NISBET (W. B.). **An Isolated Epidemic of Bacillary Dysentery.**—*Med. Jl. of Australia.* 1915. Oct. 2. Vol. 2. 2nd year. No. 14. p. 313.

Five cases of clinical dysentery occurred amongst nine people at a lighthouse in an isolated district on the coast of North Queensland. The origin of the infection is put down to fishermen visiting the neighbourhood, their excreta being supposed to be dried by wind and sun, and carried to the roofs and interiors of the houses where it infected the water and food. A bacteriological examination was made on only one of the cases. A bacillus was isolated from the faeces which morphologically and culturally belonged to the Flexner dysentery group, but showed only slight agglutination with Flexner serum (1 : 100) and none with Shiga serum.

E. E. A.

LOEWENSTEIN (Ernst). **Ueber das Vorkommen von Dysenteriebazillen in einer Pferdeschwemme.** [The Presence of Dysentery Bacilli in a Horse Pond.]—*Wien. Klin. Woch.* 1915. Sept. 16. Vol. 28. No. 37. pp. 998–999.

A number of cases of dysentery or typhoid fever occurred amongst both military and civil population at Zombor in Hungary. The one thing they all had in common was that they had bathed in the same swimming bath, which was situated on a canal about 10 yards below a horse pond. *B. dysenteriae* Flexner and *B. typhosus* were found in the latter but not in the swimming bath. Both were then closed and seven days later dysentery bacilli could not be found in the horse pond. No further cases of dysentery or typhoid fever occurred. The soldiers were known to enter the water with their horses and in this way no doubt they infected the horse pond. The infection would be easily transferred by the sluggish current of the canal to the swimming bath.

E. E. A.

PŘIBRAM (Ernst). **Die Aufgaben des Bakteriologen bei der bazillären Dysenterie.** [The Function of the Bacteriologist with Respect to Bacillary Dysentery.]—*Med. Blätter.* 1915. Sept. 20. Vol. 37. No. 18. pp. 210–212.

The clinician wants a rapid diagnosis. From this point of view the bacteriologist has several difficulties to contend with. Pure cultivation is not so easy as in the case of typhoid and cholera. We are able to obtain the specific organism from the blood of cases of typhoid fever, while in cholera other organisms than the vibrio receive a set back in the intestine. Fermentation reactions are not absolutely stable, and may therefore lead to fallacious conclusions. Again group agglutination is commonly observed, so that other bacilli may be mistaken for the suspected one unless great care is taken. Shiga agglutinating serum from horses often agglutinates a Flexner strain to the titer limit. This difficulty may be overcome by preliminary absorption of the Flexner component, but the process is too laborious for clinical use. Another obstacle is the so called para-agglutination, by which is meant that organisms closely related to *B. coli* and even streptococci obtained from the patient's faeces are agglutinated by a dysentery serum.

Testing the patient's serum with a known dysentery bacillus is a useful help to diagnosis but can only be applied in a limited number of cases owing to the amount of labour involved. An important function of the bacteriologist is to tell the clinician whether cases of intestinal catarrh are dysentery or not, which is a point of considerable moment from an epidemiological standpoint. Streptococci and such bacteria as the El Tor vibrio may produce similar symptoms but they do not give rise to an epidemic.

E. E. A.

SALUS (Gottlieb). **Zur bakteriologischen Dysenteriediagnose.** [Bacteriological Diagnosis of Dysentery].—*Wien. Klin. Woch.* 1915. Oct. 14. Vol. 28. No. 41. pp. 1101–1103.

It is probable that there is an excessive diagnosis of dysentery. Many physicians are too prone to call any case dysentery passing mucus and blood or even blood alone. The excretion of bacilli is often intermittent, especially in cases with few ulcers, so that negative findings in dysentery are common. The moral is therefore, do not rely entirely on the bacteriological examination of the stools, but also test the serum for agglutination. The diagnosis of atypical bacilli as the cause of dysentery must be undertaken with caution.

E. E. A.

EGYEDI (H.) & KULKA (Wilh.). **Eine Fehlerquelle der bakteriologischen Dysenteriediagnostik.** [A Source of Error in the Bacteriological Diagnosis of Dysentery].—*Wien. Klin. Woch.* 1915. Sept. 23. Vol. 28. No. 38. pp. 1031–1034.

A paper of a purely bacteriological nature, the gist of which is that in the hurried diagnosis of dysentery at the front in war-time, one is liable to mistake other bacteria, closely resembling it as regards morphology and fermentation reactions, for *B. dysenteriae.* Agglutination of bacilli isolated from the faeces, unless well marked, is liable to be misleading.

E. E. A.

SONNE (Carl). **Die diagnostische Bedeutung der Agglutination der giftarmen Dysenteriebacillen (Paradysenteriebacillen) in Patientenseris.** [The Diagnostic Significance of Agglutination of the Atoxic Dysentery Bacilli by the Sera of Patients.]—*Centralbl. f. Bakt.* 1. Abt. Orig. 1915. May 14. Vol. 76. No. 1. pp. 65–87.

Ueber die Bakteriologie der giftarmen Dysenteriebacillen (Paradysenteriebacillen). [The Bacteriology of Atoxic Dysentery Bacilli (Paradysentery Bacilli).].—*Ibid.* Feb. 15. Vol. 75. No. 5/6. pp. 408–456.

In a preliminary investigation of 75 cases the author has shown that there are three main groups into which the atoxic dysentery bacilli (Flexner-Y type) may be divided. The first two probably contain all the bacilli hitherto described as dysentery bacilli. The third group he claims to have established for the first time.

It has been known for some time that sera from apparently normal people possess the power of agglutinating these bacilli. The following

experiment was put up to estimate its extent. 116 sera sent in for the Wassermann reaction were tested with a bacillus of Group I, and with one of Group II.

GROUP I.

Agglutination Titer.	Per cent. of cases.
1 : 250 and higher	2·6
1 : 100 ,, ,,	16·4
1 : 50 ,, ,,	37·9
< 50	62·1

GROUP II.

1 : 250 and higher	7·8
1 : 100 ,, ,,	22·4
1 : 50 ,, ,,	37·9
< 50	62·1

GROUPS I AND II.

1 : 250 and higher	0·9
1 : 100 ,, ,,	7·8
1 : 50 ,, ,,	22·4
< 50	46·6

It is seen that a little over a third of these cases can be said to agglutinate (> 1 : 50) one or other of this type of dysentery bacilli. It must be remembered that Shiga is not being dealt with in this paper.

In all of the positive cases, bacilli of the type *B. coli* were isolated from the faeces, which were agglutinated by the corresponding dysentery agglutinating serum. This phenomenon is known as para-agglutination. The opposite of this, namely whether bacteria which are agglutinated by dysentery serum can be found in the faeces of cases whose sera do not agglutinate dysentery bacilli was answered in the negative; but only four cases were tested and it is very easy to miss some strains of bacteria which are present in the intestine. As far as it goes the evidence seems to show that the agglutinin in the sera of healthy persons has nothing to do with a previous attack of dysentery. It is laid down that in order to diagnose dysentery of the Flexner variety an agglutination in a higher dilution than 1 : 100 must be obtained. Nevertheless amongst undoubted dysentery infections Sonne found:—

1 case with a titer	1 : 1000
1 ,, ,, ,,	1 : 250
2 ,, ,, ,,	1 : 100
1 ,, ,, ,,	1 : 50

This rather points to the clinical uselessness of the agglutination test unless a very high titer is found. This does not apply to the newly discovered Group III because it is found that normal sera practically never agglutinate these bacilli. [After reading the paper through one is left with the impression that the whole matter is still *sub judice* and that considerably more work in this direction is needed.]

E. E. A.

DUENNER (L.). **Die Agglutination bei Ruhr und ruhrartigen Erkrankungen.** [Agglutination in Dysentery and Similar Diseases.]—*Berlin. Klin. Woch.* 1915. Nov. 15. Vol. 52. No. 46. pp. 1184–1185.

The outstanding feature of this article is that the author claims to be able to distinguish specific from non-specific agglutination by the density of the clumps formed. Coarse clumping of dysentery bacilli (all types) indicates a specific action ; fine clumping even with a serum dilution of 1 : 640 is not considered diagnostic. The tubes are read with the naked eye after 24 hours in the incubator, and after shaking. An agglutination in a higher dilution of serum than 1 : 50 is diagnostic for Shiga. What is a significant agglutination, or in other words what is the upper normal limit for the Flexner-Y group, is not yet certain. [It cannot be too strongly emphasized that these limits are purely arbitrary and depend upon several factors such as the method of performing the agglutination test, and above all upon the susceptibility of the strain of bacilli used. Therefore if a worker does not know his strain, he should determine its upper normal limit for himself on a large number of normal sera.]

E. E. A.

SELIGMANN (E.) & COSSMANN (Lisa). **Zur Bakteriologie der Ruhr im Kriege.** [Bacteriology of Dysentery in the War.]—*München. Med. Woch.* 1915. Dec. 21. Vol. 62. No. 51. pp. 1768–1769.

The agglutination of Shiga dysentery bacilli by a patient's serum has diagnostic significance but the agglutination of Flexner-Y type is not significant. [Many authors are agreed that the upper normal limit for the latter is at least a serum dilution of 1 : 100. An agglutination in a serum dilution considerably above this would, in the present state of our knowledge, generally be considered specific.]

E. E. A.

STRAUSS (H.). **Ueber Serodiagnostik larvierter Fälle von chronischer Dysenterie.** [Serum-diagnosis of Obscure Cases of Chronic Dysentery.]—*Deut. Med. Woch.* 1915. Sept. 2. Vol. 41. No. 36. pp. 1059–1060.

A plea for the investigation of cases of severe colitis by testing the agglutinating power of the patient's serum on dysentery and even typhoid bacilli. No hard and fast boundary can be drawn between chronic dysentery and "colitis gravis" or chronic haemorrhagic proctitis and Strauss has cleared up the diagnosis of several of these cases by proving them to be dysentery. Of 14 such cases four were proved to be caused by Shiga-Kruse, two by *B. dysenteriae* Y, and one by *B. typhosus*. In none of these cases could the specific bacilli be obtained from the stools and hence the importance of testing the blood. Dysentery agglutinins are well known to be stable, in accordance with which the author obtained a titre of 1 : 100 with Shiga-Kruse bacilli in a case that had had acute dysentery in South Africa 10 years previously and a 1 : 200 titre in another case that had suffered from the acute disease in Egypt 18 years ago. In some of

the cases gastric disturbance was a prominent symptom, to account for which it was found that the hydrochloric acid of the gastric juice was either absent or diminished in amount. Other authors have lately recorded the same thing. This abnormality apparently delays the return to health and therefore Strauss thinks that its correction (diet, HCl., etc.) is very important.

[The stability of agglutinins during such long periods as those mentioned above would rather suggest auto-infection on one or more occasions in a carrier. That agglutinins produced by one attack should be present in so high a titre for such a lengthy period is highly improbable.]

E. E. A.

NÈGRE (L.). **Infections à bacilles pseudo-dysentériques, en Algérie.** —*C. R. Soc. Biol.* 1916. Jan. 22. Vol. 79. No. 2. pp. 44–45.

A note on some bacilli isolated from the faeces of cases of fever of a typhoidal type in Algeria. None had dysenteric symptoms. The bacilli were not motile and for the most part fermented glucose with gas production, and clotted milk, a fortnight being sometimes necessary for the last reaction. Indol was produced in all cases. The patients' sera agglutinated their respective organisms in dilutions of the order of 1 : 2000 and 1 : 4000. These bacilli seem to be intermediate between *B. dysenteriae* Flexner and *B. coli.*

E. E. A.

FRAENKEL (Ernst). **Untersuchungen über Pseudodysenterie (Y-Ruhr).** [Investigation of Pseudodysentery (Y-type).]—*Deut. Med. Woch.* 1915. Sept. 30. Vol. 41. No. 40. pp. 1182–1183.

This is an account of a number of mild cases of dysentery. There were no deaths, and in 44 per cent. of the cases *B. dysenteriae* Y was obtained from the faeces. The bacillus was recovered from the stools of four patients after the fever was over, from another four during and also after the fever, and from the rest only during pyrexial attacks. The number of stools examined was 90. Using a medium containing bile, 49 blood cultures were made, one of which yielded dysentery Y. Cultures were also made from 36 urines with a positive result in one case (male), 9 test cases being taken to avoid faecal contamination, but no mention is made of a catheter being used.

Agglutination, to be of any diagnostic value for Y bacillus, should be positive in a higher dilution than 1 : 160 of the patient's serum. In order to make the agglutination test absolutely reliable it is necessary to test the patient's blood not only against dysentery bacilli, but also against typhoid and paratyphoid bacilli. Only when the agglutination of the dysentery bacillus is markedly greater than that of the others are we justified in making a diagnosis of dysentery. If this precaution is not taken, group agglutination of the dysentery bacillus caused by a previous attack of typhoid fever or an anti-typhoid inoculation may not be detected and lead to erroneous conclusions. Carriers of this type of dysentery seem to be uncommon. Out of some thousands of examinations of faeces and urine only two Y carriers (faeces) were found as against seven typhoid carriers.

E. E. A.

REMLINGER (P.) & DUMAS (J.). **La dysenterie de l'Argonne. Etude bactériologique.**—*Ann. Inst. Pasteur.* 1915. Oct. Vol. 29. No. 10. pp. 498–519.

There was a curious epidemic of diarrhoea among the troops in Argonne. It appeared to be either dysentery or paratyphoid fever. Two distinct dysentery bacilli were cultivated from the stools. One, which was found very frequently, was identical with the bacillus Y of Hiss; the other, which was only isolated a few times and then from the most serious cases, was related to *B. dysenteriae* Shiga, but was not agglutinated by Shiga serum.

E. E. A.

LEDINGHAM (J. C. G.) & PENFOLD (W. J.). **Serological Tests in Dysentery Convalescents.**—*Brit. Med. Jl.* 1916. Jan. 8. p. 47.

The authors describe the results of testing the sera of 103 convalescents, the great majority of whom gave a history of dysentery. First of all they set out to determine the upper normal limit of agglutination of *B. dysenteriae* Shiga in 23 normal persons. In none of these did they obtain more than a slight agglutination in a serum dilution of 1 : 50. Out of the 103 convalescents 54 fell within the normal limits, while the remaining 49 gave a stronger agglutination and were therefore classed as Shiga dysentery cases.

WOODCOCK found 41 per cent. of these cases carried one or more of the following protozoa in the faeces—*Lamblia intestinalis*, Trichomonas, or *Entamoeba coli*. There was no definite association between these protozoa and the Shiga cases.

E. E. A.

FLAGELLATE DYSENTERY.

CASTELLANI (Aldo). **Treatment of "Flagellate Diarrhoea" and of Kala-Azar.**—*Brit. Med. Jl.* 1915. Nov. 27. pp. 779–780.

In the first part of this paper, the author states that trichomonad and cercomonad flagellates occur in the stools of about 25 per cent. of healthy persons in the tropics, as may be determined after the administration of saline purges. He refers to two cases published by him in 1905, wherein the flagellates were present in enormous numbers and were then probably pathogenic. Ipecacuanha and emetine have no effect on such flagellates. In 1905 the author found that after mixing a loopful of flagellate-containing stools with a loopful of methylene blue solution, 1 per 1,000, the flagellates took up the colour and became almost immediately quiescent and globular in shape. He recommends the use of "methylene blue by the mouth, in cachets containing 2 or 3 grains of the drug, three times a day, and also by intestinal irrigation (1 in 5,000 or 1 in 3,000)."

The treatment induces rapid decrease or complete disappearance of the flagellates within a very few days. It may be necessary to persist with the drug in a few obstinate cases, but it must be discontinued from time to time to prevent the formation of methylene blue concretions in the intestine.

H. B. F.

Ciliate Dysentery.

Barlow (Nathan). **Treatment of Hondurian Balantidiosis.**—*Southern Med. Jl.* 1915. Vol. 8. No. 11. pp. 937–938.

Human balantidiasis is not common in Honduras. Only two cases were found in a year. In both the parasite presented certain differences from the ordinary form of *Balantidium coli.* The cilia were not arranged in rows and there was no contractile vacuole, but the cytopyge or anus was contractile. The micronucleus was seen with difficulty. The author designates the parasite *Balantidium coli*, variety *hondurense.*

The first patient gave a history of five days' diarrhoea, with eight or ten mucous stools daily, colicky pains, tenesmus, light fever and loss of appetite. The stools contained many balantidia and some blood, while hookworms were also present. Thymol did not reduce the number of the balantidia, so methylene blue was administered in two-grain doses, three times a day for two days, when there were no living ciliates to be found. Hookworms still being present, a second treatment of thymol was given. A second course of six two-grain doses of methylene blue was given as a precautionary measure. The patient had no more symptoms and gained in weight.

The second patient suffered only from balantidiasis, and at the time of admission was passing twenty stools daily, some of which contained blood. Magnesium sulphate was first administered and then one grain of emetine daily for two days. This failing to reduce the number of parasites, ipecacuanha was tried in the form of alcresta ipecac. In five days, no balantidia were found. After further precautionary treatment, the patient was clinically cured.

The author's conclusions are :—

"The balantidiosis of Honduras, if uncomplicated by pathogenic amoebae, is best treated by methylene blue, two grains three times daily, not less than four days.

"If an endamoebic or similar infection is also present, emetin combined with oral administration of some suitable form of ipecac will be appropriate for both infections. Especial stress must be placed upon the oral administration, and not less than ten days of continuous treatment be given.

"With either method, at least three thorough cleansings should be given the intestines, at the beginning, middle, and end of treatment. If hookworm be present, thymol may be given if the patient is not debilitated.

"While these results may hold good for the ordinary form of *B. coli*, the slight differences observed make it necessary to prove this point by actual experiment." H. B. F.

Zuloaga (Julio). **Balantidiosis.**—*Repert. Med. y Cirug.* 1915. Oct. Vol. 7. No. 1. [No. 73]. pp. 10–25. With 2 figs.

A very readable account of *Balantidium coli* and of the symptoms to which it gives rise in the human being, drawn from the author's personal experience. In Colombia, as elsewhere, pigs are the natural harbourers of this parasite, and it is only met with in human beings who have been in contact with them, or who drink water fouled by their excreta. For the same reason the disease is only to be met with, in the author's experience, at altitudes where the temperature lies between the extremes of 12° and 24° Centigrade, these medium climates being the only ones favourable to the breeding of domestic pigs. J. B. N.

Mixed and Unclassed Dysentery.

Ravaut (Paul) & Krolunitski. **Epidémie de dysenterie amibienne avec présence, dans quelques cas, du bacille dysentérique. Rôle tout à fait secondaire de ce bacille. Traitement de la dysenterie amibienne par l'arsénobenzol.**—*Bull. et Mém. Soc. Méd. des Hôpit. de Paris.* 1915. Oct. 21. Vol. 31. 3 ser. No. 29–30. pp. 846–851.

An account of a small epidemic of dysentery. The patients were treated in the hospital for infectious diseases at Steenvoorde, a French town north east of Lille almost on the Belgian frontier. *B. dysenteriae* was recovered from 14 out of 64 stools examined. In many cases the patients' sera agglutinated Shiga, Flexner or another bacillus isolated in the laboratory. The authors were surprised to find that the anti-dysentery serum of Dopter failed to relieve the symptoms even in 60 cc. doses, although used in cases from which the Shiga bacillus had been isolated. Several patients harbouring dysentery bacilli did not present the clinical appearance of bacillary dysentery. Another odd fact was that dysentery bacilli were often found in mild cases but not in the severe ones, and a similar anomaly was noticed with regard to agglutination. To complete the unusual features of this epidemic several types of dysentery bacilli were found. There were African soldiers among the sick. They had contracted the disease abroad and had been treated for amoebic dysentery. The authors found dysentery bacilli in their stools but not the specific amoeba. Emetine did not give good results; washing out the bowel with a solution of silver nitrate was best. In a soldier from Normandy who had never quitted France, *Entamoeba histolytica* was found in association with dysentery bacilli. This was the key to the situation. This association of the two causative agents was then found in many of the other cases in hospital. The authors point out that in such circumstances *B. dysenteriae* occupies quite a subordinate position and it is most important to deal therapeutically with the amoeba.

Better results were obtained with arsenobenzol than with emetine.

E. E. A.

Ledingham (J. C. G.) & Penfold (W. J.). **Recent Bacteriological Experiences with Typhoidal Disease and Dysentery. With Notes on the Protozoan Parasites in the Excreta by** Woodcock (H. M.).—*Brit. Med. Jl.* 1915. Nov. 13. pp. 704–711. With 4 figs.

This paper deals with the bacteriological diagnosis of cases with a history of acute dysentery, admitted to the King George Hospital. Coming from the Dardanelles district, the stools of these patients on admission were for the most part either normal or remained for some time unformed; only a few continued to discharge blood and mucus.

After detailing the laboratory methods devised to deal expeditiously with a rather large number of cases, the authors proceed to note the results obtained. Only one member of the Flexner-Y group of dysentery bacilli was isolated, which was completely agglutinated by its specific serum, but suspects were obtained probably belonging to this group although inagglutinable by the stock agglutinating serum.

The view is advanced that we are dealing with a group of high specificity, the several members of which can only be differentiated by an agglutinating serum prepared with one or more of their number. In contrast to this all the Shiga dysentery strains isolated have been easily agglutinated by the stock Shiga serum (at a dilution of 1 : 1500 to 1 : 4000). Fermentation tests may be deferred to a later date to confirm the agglutination when the latter is decisive.

Convalescents with few or no symptoms were examined once, usually with negative bacteriological findings but there were a few still passing blood and mucus or with loose motions. Shiga bacillus was isolated from 15 of these and it was found that the sera of the patients gave very high agglutination titres. The one undoubted case of Flexner-Y dysentery mentioned above was followed from start to finish in hospital. It began with high fever and the passage of blood and mucus. The bacillus obtained from the single case of dysentery which ended fatally was probably a member of this group although not agglutinated by the stock serum. The large gut showed intense inflammation post-mortem and the bacillus in question was obtained both from the colon and from the mucoid stools before death.

Details of the 15 cases are tabulated and afterwards attention is drawn to the interesting features. The stools were not all of the typical variety, some being watery with or without mucus and in two cases they were normal. This point is important with respect to the carrier question. The bacillus has been obtained at periods varying from one to four months after the onset in the present series of cases. On one occasion Shiga bacillus was isolated from the blood of a patient suffering from paratyphoid A fever during a pyrexial exacerbation. This is probably a unique finding, and must be looked upon as a dysentery carrier infected with paratyphoid A. These mixed infections perhaps constitute the most interesting section of the paper. They number four and may be detailed seriatim.

1. *B. paratyphosus* A was isolated from the blood of the case cited above on September 1st (fifth day of fever). An exacerbation of fever (so-called relapse) took place on October 6th. A pure culture of Shiga bacillus was obtained from the blood on October 11th.

2. Had dysentery in August with blood and mucus. Admitted to hospital on September 16th with slight diarrhoea and fever which lasted to September 23rd. *B. paratyphosus* A isolated from faeces on September 23rd.

3. Admitted September 16th. Fever from September 25th to October 11th. Blood culture negative on October 6th. On October 13th the patient's serum agglutinated *B. paratyphosus* B. On October 18th *B. dysenteriae* Shiga was isolated from the faeces.

B. enteritidis Gaertner was also obtained from this case.

4. Another case of convalescent dysentery showed a marked agglutination with Shiga. *B. paratyphosus* A was recovered from the faeces.

E. E. A.

An account is given by Dr. Woodcock of the intestinal protozoan parasites found in the faeces of 26 cases of dysentery or diarrhoea from the Dardanelles or France. The parasites observed were :—

	No. of cases.
Lamblia intestinalis (active and (or) encysted) ..	7
Macrostoma mesnili (active)	6
Trichomonas hominis (active)	3
Cercomonas hominis (active and encysted)	1
Active flagellates, not specifically determined (probably Macrostoma or Trichomonas).. ..	4
Coccidian cysts	5
Entamoeba coli cysts	6
Blastocystis hominis	5

The author diluted the faeces with a little sterile saline solution and made films fixed wet with osmic-acetic acid solution. The film or smear was then dried and hardened in absolute alcohol. Giemsa's stain was employed. The essential features of the morphology of the parasites in the preceding list are given. The pathogenicity of the flagellates is discussed, Trichomonas and Lamblia being the most important. Three cases of lamblial diarrhoea, apparently uncomplicated by the presence of other organisms, are mentioned, and details are given of one of them. The use of turpentine [more particularly for Trichomonas diarrhoea] is noted.

H. B. F.

Ismail (Abd El-Aziz). **Cases of Diarrhoea from Gallipoli.** *Lancet.* 1915. Oct. 23. pp. 920–921. With 2 charts.

A record of 50 consecutive cases of diarrhoea treated in Cairo. Twenty of these were post-dysenteric diarrhoea, having had blood and mucus in the stools 3–10 days earlier. In 15 of these amoebae were found, while three more responded quickly to emetine and therefore probably had a similar origin. *B. dysenteriae* Flexner was isolated from the remaining two cases. The amoebic cases were much the milder. The temperature never rose above 38·4°, while in the bacillary cases it reached 39° and 40° and the disturbance was more severe.

Another group of five cases of diarrhoea had amoebae in their stools but no blood or mucus was passed. The symptoms were slight, temperature 37°–38°, abdominal colic, and occasional diarrhoea. Here the author contradicts his statement above by saying mucus was present in which amoebae were found. There was rapid improvement on emetine.

E. E. A.

WENYON (C. M.). **Observations on the Common Intestinal Protozoa of Man. Their Diagnosis and Pathogenicity.**—*Lancet.* 1915. Nov. 27. pp. 1173-1183. With 1 plate.

The Development of the Oöcyst of the Human Coccidium. An Addendum.—*Ibid.* Dec. 11. pp. 1296. With 4 figs.

Another Human Coccidium from the Mediterranean War.—*Ibid.* Dec. 25. p. 1404. With 1 fig.*

The author describes the main morphological features, differential characters and life-cycles of *Entamoeba histolytica*, *E. coli*, *Amoeba* (*Vahlkampfia*) *limax*, *Trichomonas intestinalis*, *Lamblia intestinalis*, *Tetramitus mesnili* and *Balantidium coli*. Mention is made of Cercomonas, Bodo and Prowazekia and their possible occurrence in human faeces. Also a few cases of the occurrence of Coccidian cysts, belonging to the genus Isospora, in human faeces are mentioned. The yeast-like organism, *Blastocystis hominis*, is discussed. All of these organisms have been described and their pathogenicity discussed in this *Bulletin*, from time to time, so that it is unnecessary to repeat well-known morphology and life-history.

Oöcyst of Isospora.

Oöcyst of Eimeria.

The author wisely advocates the examination of these intestinal protozoa in the fresh and living state, in *fresh* stools, and points out the use of dark-ground illumination. Faeces should be kept cool. The addition of iodine to stools on the slide in order to detect nuclei in cysts is recommended. For permanent preparations, smears of faeces, fixed with sublimate alcohol and stained with iron haematoxylin are recommended. The use of a micrometer scale in the eyepiece—for determining the dimensions of the structures observed—is also noted.

[Apparently the intestinal flagellates are not considered to be markedly pathogenic. ESCOMEL's work on Trichomonas diarrhoea

**See* also WENYON (C. M.). Observations on the Common Intestinal Protozoa of Man: Their Diagnosis and Pathogenicity.—*Jl. R. Army Med. Corps.*, 1915. Dec. Vol. 25. No. 6. pp. 600-632. With 2 plates and 60 figs. (Reprinted from the *Lancet*, Nov. 27th, 1915, with a new Appendix.)

[this *Bulletin*, Vol. 1, p. 719] is referred to, but it is stated that "this interesting work needs confirmation." LYNCH has already afforded confirmation in some respects [see this *Bulletin*, Vol. 6, p. 469]. No mention is made of MATHIS' important work on Lamblia [this *Bulletin*, Vol. 4, p. 315] and the opinions of several workers (positive as to pathogenicity) might have been mentioned. Thus, the views of BRUMPT, SMITHIES, and MELLO-LEITAO are summarised in this *Bulletin*, vol. 1, pp. 189, 469 and 718 respectively, also those of GÄBEL in this *Bulletin*, vol. 3, p. 465, and of several other authors in this *Bulletin*, vol. 4, pp. 314–318.]

In an addendum the author briefly describes two different kinds of coccidian oöcysts found in human faeces. The first note deals with oöcysts containing two sporocysts, each of which enclosed four sporozoites; such belong to the genus Isospora.

The second note is concerned with oöcysts belonging to the genus Eimeria. These oöcysts were nearly spherical with a diameter of 20μ. Four sporocysts, each containing two sporozoites, were present in an oöcyst, on the external surface of which small ridges occurred. The author notes that the oöcysts of Isospora were passed in a relatively immature condition, while those of Eimeria were mature when passed.

H. B. F.

FANTHAM (H. B.) & PORTER (Annie). **Notes on Certain Protozoa which may be found in Cases of Dysentery from the Mediterranean War Zone.**—*Proc. Cambridge Philosoph. Soc.* 1916. Jan. Vol. 18. Pt. 4. pp. 183–188. [Read Nov. 22, 1915.]

The authors record the essential features of the Protozoa they have personally investigated in cases of dysentery from the Mediterranean. The organisms considered are *Entamoeba histolytica* and *E. coli*; *Trichomonas hominis*, *Chilomastix* (*Tetramitus*) *mesnili*, *Giardia* (*Lamblia*) *intestinalis* and *Cercomonas hominis*; *Balantidium coli*. Of *Entamoeba histolytica* "the tetranucleate cyst is characteristic and diagnostic and the cysts are the infective stages." In the stools of subacute cases of amoebic dysentery examined by the authors uninucleate and tetranucleate cysts were observed. The flagellates are briefly described with references to the papers of those who attribute pathogenicity to them, and notes on geographical distribution and treatment. Spirochaetes, some of them resembling *S. eurygyrata* Werner, were found in the faeces of some patients. Under ciliate dysentery it is pointed out that swine-herding is an important occupation in Serbia and that therefore balantidial dysentery may occur in the troops operating there.

A. G. B.

ESCOMEL (Edmundo). **Las disenterias en Arequipa.** [Dysentery in Arequipa.]—*Cronica Med.*, Lima. 1915. Dec. Vol. 32. No. 630. pp. 297–351. **With 1 coloured plate and 7 figs.**

An exhaustive account of the various kinds of dysentery met with by the author in practice in Arequipa (Peru). The only kind missing from the list is bacillary dysentery. The author differs from the majority of nosologists in including non-contagious forms of enteritis

under the term dysentery, as for example the enteritis, or more properly proctitis, caused by the excessive consumption of red pepper (Aji). The diarrhoea incidental to cancerous ulceration of the bowel is also tabulated as a dysentery, rather needlessly, as it seems.

The classification adopted by the author is :—

1. Amoebic dysentery.
2. That due to *Trichomonas intestinalis* (Leuckart 1879), of which he has observed 152 cases. The author speaks of abscess of the liver as incidental to this form of infection and says that it should be treated by aspiration, with subsequent injection into the cavity of not more than 2 grammes of turpentine. Turpentine given by the mouth is also said to be a specific for this form of dysentery.
3. That due to *Tetramitus mesnili* (Wenyon).
4. That due to *Balantidium coli.*
5. That due to paludism. In the bowel-mucus of this form, according to the author, malarial pigment and cells containing haematozoa will be found.
6. Dysenteries due to ankylostomiasis, the consumption of red pepper, and cancer, as already mentioned.

The value of this paper is perhaps hardly in proportion to its length.

J. B. N.

Noc (F.). **Parasitisme intestinal en Cochinchine. (Nouvelle contribution à l'étude des dysenteries indo-chinoises.)**—*Bull. Soc. Path. Exot.* 1916. Jan. 12. Vol. 9. No. 1. pp. 15–20.

This paper is an analysis of the causes of chronic diarrhoea in French Cochinchine. They are as follows :—

1. Amoebic.
2. Combination of amoebic and bacillary.
3. Bacillary.
4. Any of the above in combination with Trichocephalus, Lamblia or Trichomonas.

The worm Strongyloides is frequently found in the intestine but it does not seem likely that it causes diarrhoea by itself. It may aggravate diarrhoea of a different origin.

E. E. A.

Ross (Ronald). **A Lecture on the Treatment of Dysentery. Delivered before the Royal Society of Medicine on Dec. 20th, 1915.**—*Lancet.* 1916. Jan. 1. pp. 1–7 : and *Proc. R. Soc. Med.* [Occasional Lectures.] 1916. Jan. Vol. 9. No. 3. pp. 73–90.

After an historic survey of the treatment of the disease up to the present day, some facts are given concerning the dysentery of the war as seen in Egypt. Bacillary dysentery prevailed up till midsummer, but an epidemic of amoebic type made its appearance in July and August 1915. After September it began to get scarce again and was displaced by bacillary in the winter. The cases among the British troops were more severe than among the Indian soldiers, who are in contact with the disease from childhood. The usual emetine treatment

for amoebic cases was resorted to. A small number, 10 per cent.–20 per cent. of the patients were not benefitted by emetine, and they were mostly cases in which it had not been administered until rather late. Mixed amoebic and bacillary infections were frequently seen, sometimes complicated by typhoidal disease. Experience has taught that amoebic ulceration of the bowel may not always give rise to the well-known signs; in fact the author believes that the amoebae may cause extensive lesions without any signs whatever, and that the typical disease becomes manifest only after some secondary invasion of intestinal bacteria has taken place. On the strength of these veiled cases the medical officers have been giving emetine pretty freely to hospital patients in the same way that quinine is given to them in a very malarious locality. Sodium and magnesium sulphates are generally given in combination with emetine. There is a difference of opinion as regards the efficacy of anti-dysentery serum but many successes were seen. Bismuth, tannic acid and opium are useful. Adrenalin is recommended for the collapse often seen in severe cases. The wisdom of employing intestinal washes in early cases is questioned. Appendicostomy did not give encouraging results. The avoidance of liver abscess is one of the most important points to keep in mind when considering the treatment of amoebic cases. Abscesses continue to appear for years after the original attack and the only way to avoid this danger is to give emetine in convalescent cases every month or so. The author suggests grain doses should be given for three days every month until the patient is ready to work again, irrespective of whether any symptoms of dysentery remain or not. This plan should be adopted even in cases where a positive diagnosis of amoebic dysentery has not been made.

Ipecacuanha is useful in the later stages of the disease.

E. E. A.

i. Marcovici (Eugen). **Zur Behandlung der akuten und chronischen Dysenterie mit Allphen.** [Treatment of Dysentery with Allphen.] —*Wien. Med. Woch.* 1915. Aug. 14. Vol. 65. No. 33. pp. 1239–1246. With 10 charts.

ii. Marcovici (Eugen) & Přibram (Ernst). **Klinische und experimentelle Untersuchungen über die Wirkung von *Allium sativum* und daraus dargestellten Präparaten (Allphen) bei infektiösen Darmkrankheiten.** [Clinical and Experimental Investigations into the Action of *Allium sativum* and its Preparations (Allphen) in Infectious Intestinal Diseases.] — *Wien. Klin. Woch.* 1915. Sept. 16. Vol. 28. No. 37. pp. 993–997.

i. Allphen is a compound of garlic and salol [see later paper on the same subject]. Quite good results have been obtained by its administration in dysentery and in other infectious intestinal catarrhs, but not in intestinal tuberculosis or amyloid disease. Its mode of action is not yet clear.

ii. Marcovici has had extremely good clinical results in cases of dysentery, cholera and other diarrhoeas, with Allphen. This is a combination of garlic, obtained from the tuber of *Allium sativum*, with salol. The tubers must be carefully dried at a low temperature in a vacuum, powdered, and mixed with salol in the proportion of

0·5 : 0·15 respectively. The dose is 4 to 5 grams daily. In about five days acute cases were nearly normal again with normal formed stools except for the presence of a little mucus. Chronic cases took a little longer to cure but the action of the drug on them was very satisfactory. In the case of carriers the specific micro-organisms disappeared from the faeces in 4–5 days.

Pribram is responsible for the animal experiments. He started feeding rabbits with allphen but finding that long continued doses were toxic, he omitted the salol, giving the dry powdered garlic in doses of 2·5–5 grams daily. This could be continued for weeks without the slightest injurious effects. By feeding a few days in advance it was found to protect against 10 lethal doses of the toxin of Shiga's bacillus introduced into a vein. Further it rendered small doses of the living bacilli themselves innocuous (0·1 drop of a virulent strain intravenously).

E. E. A.

du Mont. **Behandlung von Ruhr und ruhrähnlichen Darmkatarrhen.** [Treatment of Dysentery and Similar Diseases.]—*Deut. Med. Woch.* 1915. Sept. 9. Vol. 41. No. 37. p. 1101.

The author recommends injections of a cup of warm water containing 0·5 gram dermatol and 15 drops Tct. Opii at first thrice daily, which should be decreased to twice and once daily *pari passu* with the fall in the number of stools.

At one time the author was unable to obtain dermatol and substituted 100 grams " Bolus " in combination with the same amount of Tct. Opii as before in $\frac{1}{2}$–$\frac{3}{4}$ litre of water. The injections were retained for one to three hours and then only partially voided. A strict oatmeal diet was enforced. Sixty cases were treated thus with excellent results, most of them being able to work again in two or three days. [" Bolus " is aluminium oxide. Its use is to adsorb any toxins it comes in contact with.]

E. E. A.

Arnold (W. J. J.). **Sodium Sulphate in Dysentery and Infantile Diarrhoea.**—*Brit. Med. Jl.* 1916. Jan. 8. p. 49.

The author uses sodium sulphate in a dose of 5–15 grs. every two or three hours for children under one year. A preliminary dose of castor oil is recommended. Milk is excluded from the diet for a few days. The mortality is reduced to an almost negligible quantity by this treatment of infantile diarrhoea.

Dysentery should be treated by 1 drachm doses, every hour or two. The frequency of dosage decreases as the condition improves. This applies to both amoebic and bacillary dysentery. If amoebae persist, emetine should of course be given.

E. E. A.

BALFOUR (Andrew). **Notes on the Treatment of Diarrhoea and Dysentery issued by the Advisory Committee for the Prevention of Epidemic Diseases in the Mediterranean Expeditionary Force.**—*Jl. R. Army Med. Corps.* 1915. Nov. Vol. 25. No. 5. pp. 473–481.

As its title suggests this is a semi-official communication dealing with the common forms of treatment in use for the various types of dysentery and diarrhoea. It is meant for doctors who are not familiar with dysenteric disease, and does not contain any new lines of treatment.

E. E. A.

GLASSON (C. J.). **Bismuth—X-ray Localisation of Dysenteric Ulceration.**—*Proc. Roy. Soc. Med.* 1915. Dec. Vol. 9. No. 2. Med. Section. pp. 39–50.

The technique is as follows :—

Bismuth subnitrate is given in 60 grain doses every two hours for at least six days. On the sixth day a radiogram is taken, the bismuth is discontinued, and liquid paraffin is administered in 2 dr. doses every two hours for 24 hours. A second radiogram is then taken which will show the position of any ulcerative patches.

It is pointed out that the method may be useful to practitioners in chronic cases. Several cases are described and radiograms reproduced. One of the cases died, and the lesions seen post-mortem agreed with those shown by the radiogram. All the cases were amoebic dysentery. The paraffin is given to clear the excess of bismuth from the bowel, when a certain amount is left behind in the ulcerated patches.

E. E. A.

HIRSCH (C.). **Ueber Ruhr und ihre Behandlung im Felde.** [Dysentery and its Treatment.]—*Deut. Med. Woch.* 1915. Sept. 30. Vol. 41. No. 40. pp. 1179–1182.

This article is a lengthy statement of the author's views about dysentery. The first portion deals with the various causes, and attention is called to the multiplicity of possible aetiological factors some of which are purely hypothetical, for instance other bacteria and protozoa than those already discovered. Other factors, which usually receive scant consideration, are irrational diet, chemical poisons, etc. In the latter half of the paper, dealing with treatment, there is nothing really new. For the tenesmus the author recommends rectal injections of animal blood-charcoal, one heaped-up tablespoonful to the litre of warm salt solution.

E. E. A.

WHITTAKER (H. A.). **A Water-borne Dysentery Epidemic. Caused by using Water from an Auxiliary Fire Connection.**—*U. S. Public Health Rep.* 1915. Nov. 26. Vol. 30. No. 48. pp. 3473–3475. With 1 diagram.

An account of an outbreak of dysentery occurring among the employees of a stock yard company at St. Paul, Minnesota. About 80 were smitten, most of them on the same day, October 21st, 1914.

In times of stress the water supply from wells was augmented by another from the Mississippi River, which presumably conveyed the infection in this instance. Enquiry elicited the fact that on October 19th and 20th the river water supply was drawn upon, which analysis proved to be contaminated. No further information either about the disease or the "contamination" is given.

E. E. A.

DALE (H. H.). **A Preliminary Note on Chronic Poisoning by Emetine.** —*Brit. Med. Jl.* 1915. Dec. 18. p. 895.

Experiments have been started to inquire whether repeated doses of emetine can produce cumulative poisoning. Cats and rabbits received doses which corresponded to rather more than 1½ grains for an average man. This dose is somewhat in excess of that usually administered to man, but was deliberately chosen in order to obtain some information on this important subject without delay. Although care is needed in applying the results obtained in the lower animals to man, the author feels justified in announcing that there is definite evidence of cumulative poisoning.

E. E. A.

VELAZCO (Luis V.). **Un caso de intoxicatión por el clorhidrato de emetina.** [A Case of Poisoning by Chlorhydrate of Emetine.]—*Gaceta Med. de Caracas.* 1916. Jan. 15. Vol. 23. No. 1. pp. 7–8.

A case of intoxication by chlorhydrate of emetin.

The patient was a woman, aged 20 years, who was admitted to hospital for symptoms, of three months' duration, of amoebic dysentery. Treatment was begun with a single injection of 6 centigrammes of the alkaloid, followed by eleven more of 3 centigrammes each, given on 12 consecutive days. This produced no untoward result, and the dysentery having improved, the treatment with emetin was discontinued and replaced by the administration of astringents. After a month's interval, the dysentery not having wholly subsided, the treatment with emetin was resumed, and eight consecutive doses of 6 centigrammes each were given on the same number of days. Unpleasant symptoms of the nature of paralysis then supervened, which compelled the immediate discontinuance of the drug. The patient began to complain of loss of power in all the extremities with a feeling of laxity in the spine, so that the act of sitting up produced intense weariness. Upon testing, the skin of the whole surface of the body was found to be more or less analgesic, though tactile and thermic sensibility were preserved, and sense of position. Patellar and ankle reflexes were preserved, but the periosteal and tendinous ones were absent. Babinsky's, Gordon's and Oppenheim's signs could be elicited on the left side. The plantar reflex was abolished; the abdominal ones preserved. The pupils contracted normally. The pulse was accelerated and weak, 144 to the minute. The bowels had been confined for four days. Examination of the cerebro-spinal fluid showed a strong leucocytic reaction (neutrophile polynuclears 61 per cent., large mononuclears 18 per cent., lymphocytes 21 per cent., and eosinophiles none). Urine, no albumin or sugar. Electrical testing showed Erb's and Duchenne's phenomena to be present. Deglutition was somewhat difficult, while the palate was flaccid.

For the relief of these symptoms, which were at once ascribed to the emetin, two parallel rows of cautery points were applied to the whole length of the spine, and an injection of sulphate of spartein was given.

The symptoms gradually subsided upon discontinuance of the emetin, and at the end of a month were wholly gone, the difficulty of deglutition and the sense of muscular weakness being the last to disappear.

The author has since come upon the record of an exactly similar case in the *Presse Médicale* of Paris for April 15th, 1914, by SPEHL and COLLARD, as the result of giving daily doses of 6 to 9 centigrammes of emetine, which he quotes at length. The conclusion drawn is that emetin should be given in doses not larger than 5 to 10 centigrammes daily for not more than five days in succession, an interval of at least five days being allowed to elapse before the treatment is resumed.

J. B. N.

CHOLERA.

MUELLER (Paul Th.). **Ueber Choleramassenuntersuchungen.** [Cholera Diagnosis on a Large Scale.]—*München. Med. Woch.* 1915. Nov. 30. Vol. 62. No. 48. pp. 1659–1660.

An examination for cholera carriers on a large scale (several battalions), which differed from the usual in that the faecal specimens were examined 10–12 mixed together, and only when *V. cholerae* had been detected in one of these groups, was the group examined individually. The author fell upon this plan owing to the shortness of time and means at his disposal, and decided that at any rate the more dangerous carriers, those excreting large numbers of vibrios, would not escape detection owing to the modification of method adopted.

H. Schütze.

SCHUERMANN (W.) & FELLMER (T.). **Zur bakteriologischen Choleradiagnose.**—*Deut. Med. Woch.* 1915. Sept. 30. Vol. 41. No. 40. pp. 1183–1184.

To test the efficacy of ARONSON's cholera medium, which is an alkaline agar plus cane sugar, dextrin and fuchsin decolourised with sodium sulphite, the authors compared it with Endo's medium and Dieudonné's. Imitation cholera stools were prepared by thinning normal faeces with peptone water and adding *V. cholerae* (12 strains tested) in quantities of 1/100–1/1,000,000 of a loop per 5 cc. stool. The plates were spread without enrichment and examined after 18–20 hours' incubation.

The authors decided that Aronson's medium is to be preferred on account of the ease with which the red coloured cholera colonies are detected and because the medium is more easily prepared and immediately ready for use. Neither agglutination nor motility is impaired after growth on Aronson. While cholera-like colonies are indistinguishable from those of the true Koch vibrio, they show no tendency to oust *V. cholerae* from the plates even when these cholera-like vibrios predominate in a mixture of the two.

Four of seven stools from suspected cholera cases, finally, gave similar results on Aronson and Dieudonné; three times however *V. cholerae* was isolated from Aronson but not from Dieudonné.

H. S.

BOETTICHER (Eduard). **Die bakteriologische Choleradiagnose, unter besonderer Berücksichtigung der von Aronson und Lange neuerdings angegebenen Choleranährböden.** [Bacteriological Cholera Diagnosis, with special Reference to the New Media of Aronson and Lange.]—*Deut. Med. Woch.* 1915. Oct. 28. Vol. 41. No. 44. pp. 1303–1305.

In experiments carried out with cholera cultures and artificially infected stools, the author came to the conclusion that the Aronson medium (100 cc. 3 per cent. agar + 6 cc. 10 per cent. anhydrous soda + 7·5 cc. 20 per cent. cane sugar + 0·4. cc. concentrated alcoholic fuchsin + *ca.* 0·7 cc. 10 per cent. sod. sulphite) [this *Bulletin*, Vol. 6, p. 495] owing to its not giving a massive growth of *V. cholerae*, can

not supplant Dieudonné, but that by reason of its marked alkalinity repressing the growth of *B. coli*, its colour reaction indicating the cholera colony and simplifying the task of diagnosis for the less experienced, and by reason of its giving a more easily agglutinable culture than does Dieudonné, it is a valuable resource in the absence of alkaline haemoglobin media (Dieudonné and Esch). Lange's agar (1 part 5 per cent. starch solution + 6 parts alkaline agar containing 40 cc. of 10 per cent. sod. carb. to 1000 cc. neutral agar) [this *Bulletin*, Vol. 6, p. 499] on the other hand does not differentiate *V. cholerae* sufficiently from a number of other stool bacteria which also attack starch, nor when it is used may a stool be thickly plated owing to the presence of diastatic ferments which would render the whole plate transparent.

H. S.

STERN (Wilhelm). **Vergleichende Untersuchungen mit festen Cholera-Elektivnährböden. Ergänzung zur Aronsonschen Methode.** [A Comparative Examination of Cholera Media: Aronson's Method Supplemented.]—*Wien. Klin. Woch.* 1915. Dec. 16. Vol. 28. No. 50. pp. 1383–1385.

After comparing the cholera media of Dieudonné and Esch with Aronson's fuchsin sugar medium [this *Bulletin*, Vol. 6, p. 495], using pure cultures of various intestinal bacteria and artificially infected stools, and finding that Aronson's was more selective than the other two, the author had an opportunity of testing the three in a small cholera outbreak.

The table shows that the superiority of Aronson's medium was again proved, in that while fewer plates showed growth and thus needed attention, a larger number of positive findings were obtained on it.

Of the 75 stools examined.

Plates.	Showed growth.	Were positive.
Dieudonné's blood-alkali agar ..	40	9
Esch's sodium-meat-agar	42	9
Aronson's fuchsin-sugar-agar ..	26	12

Another feature in its favour was the ease with which *V. cholerae* colonies grown on Aronson emulsified, as is well known colonies from Dieudonné sometimes emulsifying so badly as to render an agglutination test impossible until an ordinary agar subculture has been obtained.

One difficulty in the use of Aronson's medium appears to be the presence of glycolytic ferments and coli strains which split, though slowly, the sugars, thus simulating and obscuring the cholera colonies.

The author prepares a liquid modification of Aronson—2 per cent. peptone, 2 per cent. dextrin, 2 per cent. cane sugar and 0·5 per cent. NaCl [? in water], filtered and 2·5 cc. [? to 100 cc. solution] of a 100

per cent. [? 10 per cent. meant] Na_2CO_3 solution is added; the whole is boiled and filtered and to 200 cc. are added 0·2 cc. of 10 per cent. fuchsin and 2·5 cc. freshly prepared 10 per cent. sodium sulphite. This medium is said to become red within eight hours only when inoculated with *V. cholerae*, as opposed to all other intestinal bacteria except the cholera-like vibrios.

H. S.

CASTELLI (Giorgio) & VIGANÒ (Luigi). **A proposito della diagnosi batteriologica rapida del colera.** [On the Rapid Bacteriological Diagnosis of Cholera.]—*Policlinico.* Sez. Prat. 1916. Feb. 27. Vol. 23. No. 9. pp. 261–268.

With the experience of the examining of several thousand specimens at the Istituto Sieroterapico in Milan, the authors discuss the various cholera media, describe those methods [the usual ones] adopted by themselves and are of the opinion that Aronson's cholera medium is to be recommended on account of the ease with which the cholera colonies on it are picked out and on account of the precision with which the alkalinity of the medium can be established, an important detail, which in Dieudonné's medium with a varying alkali-protein compound is not possible. They find however that STERN's liquid modification of Aronson [see above] is not satisfactory in that a red colour develops equally well as a result of glycolytic ferments and a whole series of saccharine fermenting organisms being present, which organisms would on the solid medium have been distinguishable from *V. cholerae.* [No details of any comparative experiments given at all.]

H. S.

KOEHLISCH & OTTO. **Vergleichende Untersuchungen und Versuche mit einigen Cholera-Electivnährboden. Ein neuer Elektivnährboden..** [A Comparative Examination of Some Selective Cholera Media and a New One.]—*Zeitschr. f. Hyg. u. Infektionskr.* 1915. Oct. 26. Vol. 80. No. 3. pp. 431–446.

A concise summary of recent opinion on selective cholera media, and original comparative experiments which tend to show that Pilon's medium (Dieudonné's modified by the addition of sodium carbonate in place of caustic soda) surpasses the others, including their own new medium, an alkaline cheese agar which was desired to contain a more readily obtainable ingredient than blood, namely, soft milk cheese. The experiments were carried out with cholera and coli cultures and cholera-free stools, there being no cholera stools available.

H. S.

BALDONI (Alfredo). **Rilievi di tecnica sulla diagnosi batteriologica del colera nell' attuale profilassi.** [The Bacteriological Diagnosis of Cholera.]—*Policlinico.* Sez. Prat. 1916. Jan. 2. Vol. 23. No. 1. pp. 3–4.

In certain cholera cases and carriers the author, while able on examining the stool-peptone water cultures microscopically to discover a few typical looking vibrios, was yet unable to obtain cholera colonies

on plating from the peptone water on to Dieudonné or any of the usual cholera media, and that even after prolonged incubation of the peptone water. On varying the technique however he succeeded. Subcultures were made from the surface of peptone water to peptone water every four hours; after the second or third transplantation it was possible to get colonies to grow on Dieudonné. The organisms thus isolated were in every way typical. An explanation of this difficulty of isolation is put forward by the author, who suggests that prophylactic inoculation by reason of the antibodies produced may have altered the cultivability of the organism and that only after a number of generations in a liquid medium does normality in this respect return.

H. S.

SOBEL (Leo Lucius). **Praktische Nährböden zur Diagnose von Cholera, Typhus und Dysenterie.** [Simple Media for the Diagnosis of Cholera, Typhoid and Dysentery.]—*Deut. Med. Woch.* 1915. Dec. 30. Vol. 41. No. 53. p. 1573.

Searching for some cheap, easily obtainable substitute for peptone and meat extract as ingredients of culture media, the author tried Pilsen beer. Half a litre, heated to drive off the alcohol + water to 1 litre + 15 gm. agar + 5 gm. lactose + 1 gm. Congo red (or Litmus) gave two media on which cholera, typhoid, dysentery and coli bacteria were found to grow well and with colour reactions according to whether lactose was fermented or not.

H. S.

YAKIMOFF (W.-L.) & DEMIDOFF (A.-P.). **Choléra et Dysenterie amibienne.**—*Bull. Soc. Path. Exot.* 1915. Nov. Vol. 8. No. 9. pp. 641–643.

A short account of the examination method employed at the laboratory with the Russian army of the Caucasus, attention being drawn to the necessity in hot countries of searching the stools of cholera suspects for amoebae as well as *V. cholerae.* The former, as the authors found in two cases, may give rise to the most pronounced choleraic symptoms. In 140 stool examinations, *V. cholerae* was found in 36 cases, amoebae in 16, amoebae plus *V. cholerae* in six and in one case *V. cholerae* together with *Lamblia intestinalis.*

H. S.

LOEWY (Otto). **Bilden Choleravibrionen Hämotoxine?** [Does *V. cholerae* produce Haemotoxins?]—*Centralbl. f. Bakt.* 1. Abt. Orig. 1915. Jan. 15. Vol. 75. No. 4. pp. 319–329.

An examination of 103 cholera strains (51 coming from the 1913 Roumanian epidemic, 21 from the 1912 one in Bulgaria, 4 from Galicia and 27 being older laboratory cultures) and of 11 El Tor and cholera-like strains. Only three of the true choleras failed to agglutinate right to the titre limit of a cholera serum, whereas of the cholera-like strains only four of the 11 agglutinated so far. With regard to the production of haemotoxins, it was found that none of the 103 cholera strains either caused haemolysis when grown on sheep or goat blood

agar, or formed haematoxins after five days' growth in broth (the test for haemotoxins being carried out here by centrifuging the broth culture and adding 0·1–1·0 cc. of the supernatant to 2 cc. of a 5 per cent. guinea-pig or rabbit blood emulsion and incubating at 37°), whereas in the case of all the El Tor and cholera-like strains haemolysis took place in both experiments.

On the other hand a proteolytic ferment, capable of destroying and bleaching haemoglobin once it has been set free from the corpuscles and which is probably identical with the gelatine liquefying one, is produced by all the vibrios irrespective of whether they can occasion true haemolysis or not.

H. S.

GAUDUCHEAU (A.) & PELTIER (M.). **Sur quelques caractères d'un vibrion cholérique du Tonkin.**—*Bull. Soc. Méd.-Chirurg. Indochine.* 1915. Mar. Vol. 6. No. 3. pp. 105–107.

A description of a cholera strain isolated in Tonkin which differed from their laboratory strain (Bombay) in producing a pellicle on liquid media very slowly and in agglutinating with typical cholera serum very unreadily and to a lesser extent after a period of cultivation on artificial media.

H. S.

BAIL (Oakar). **Untersuchungen über die Veränderlichkeit von Cholera-vibrionen.** [Experiments on the Variability of *V. cholerae.*] – *Cent. f. Bakt.* 1. Abt. Orig. 1915. Dec. 29. Vol. 77. No. 3. pp. 234–248.

After finding that a saline emulsion of a cholera strain freshly isolated at the German front and left standing at 42° for eight days gave atypical as well as typical colonies when plated on to agar, the author examined the strain for variation forms. These forms were then seen to be characterised chiefly by an altered colonial appearance when grown on agar, but also by a difference in the morphology of the vibrio itself, though this point was not closely followed by the author; the agglutinability of the strain was not found to be different in any of the forms.

The chief variations in colonial appearance were broadly speaking a wrinkled form resembling *B. mesentericus* and a half-wrinkled form intermediate between this and the typical smooth cholera colony. The wrinkled form was obtained first and resulted from the eight days keeping of a saline cholera emulsion at 42°; here on plating only 10 per cent. of the colonies presented a smooth typical appearance, the remainder being wrinkled atypical forms. Subcultures made from these on to broth or peptone water for 1–2 hours at 37° and then on to agar plates (the so-called short generation subculture) resulted in the wrinkled form splitting after the second subculture into the wrinkled and half-wrinkled forms, which then by remaining unaltered through a series of 26 short generation subcultures appear to have become perfectly stable, the unwrinkled types giving only unwrinkled

colonies and the half-wrinkled types only half-wrinkled ones (in this the author confirms BAERTHLEIN, who also found that variation forms remain constant when frequently subcultured, but tend to revert if not). This stability only continued if the subcultures were short generation ones.

At the 16th short generation subculture of these three types, they were inoculated into broth and on to agar at room temperature and after 30 days plates made therefrom. The smooth typical form gave again only smooth colonies, but the half-wrinkled form gave, besides half-wrinkled colonies, about 10 per cent. of a new dry, very finely wrinkled type which, however, after two short generation subcultures developed into the usual wrinkled form as which it then remained.

More remarkable still was the result on subculturing from the old culture of the wrinkled type; here but one sort of colony grew—a form differing from the typical mother type only by a certain flatness; no trace of wrinkling remained and in three short generation subculturings the organism had reverted in all respects to the original smooth typical form. Simply by subculturing from old cultures it was thus possible to convert some of the half-wrinkled forms into wrinkled ones and to recover the smooth typical form from the wrinkled one, though subsequent repetitions of the experiment showed that the percentage of colonies showing these changes varies from time to time.

Apart from these two variation types, a great number (over 30) of other intermediate forms were observed; in none of them however was the same degree of stability seen; these unstable forms were obviously but temporary stages held as the organism passed from one stable form to another.

It appeared to the author that, as most observers of cholera variation have seen no forms really differing more widely from one another than those recorded here, there must be but a limited range of variation possible to *V. cholerae* and that it is not to be expected that totally different forms could arise.

The author sees the possibility of some factor, e.g., the ageing of a culture, awaking the variation tendency in a cholera strain and resulting in the production of, say, the wrinkled form, which is then stabilised and made heritable by some other influence, perhaps an unaccustomed temperature or product of metabolism, acting upon it; he sees the possibility then of a bacteriologist being faced with what looks most unlike *V. cholerae* but, as the agglutination would show, undoubtedly is.

H. S.

ROHBERG (David N.). I. **The Rôle played by the Insects of the Dipterous Family Phoridae in Relation to the Spread of Bacterial Infections.** II. **Experiments on** *Aphiochaeta ferruginea* **Brunetti with the Cholera Vibrio.**—*Philippine Jl. Sci.* Sect. B. Trop. Med. 1915. Sept. Vol. 10. No. 5. pp. 309–336.

The species *Aphiochaeta ferruginea* belonging to the *Phoridae* family of the Diptera is a frequent breeder in human faeces and of such small size that the flies can pass through the meshes of ordinary flyproof gauze. Recognising its possible danger as a distributor of cholera

organisms the author therefore examined it, as described in the second part of this paper, to decide the following points:—(1) Whether or not cholera vibrios are harboured during the chrysalis stage. (2) Is infection transmitted from the chrysalis stage to the imago? (3) Do adult flies, when fed on cholera vibrios, harbour these organisms on their surfaces or in their intestinal tracts; and for what length of time do they remain infective?

After giving the method of trapping and identifying flies, the paper goes on to describe the difficulty of keeping larvae alive in a pure culture of cholera vibrios until the adult form emerges. It was found necessary to have a medium with as little putrescible material as possible, to take larvae almost ready to pupate and to place them on sterile sand which was repeatedly wetted with cholera broth culture, sterile egg albumen serving as food for the larvae.

Pupae that subsequently developed were taken, washed in lysol, then in sterile salt solution and finally in peptone water, which served as control for the total removal of vibrios from the surface and did in fact never show growth of *V. cholerae.* Such pupae on being crushed in a further peptone water tube gave a growth of *V. cholerae* as well as of a coccus and a spore bearer. A larva still actively moving taken later in the experiment from the sand and treated in the same way as the pupae had been, except that in this case the extremity openings were closed by searing with a red-hot metal rod, gave no vibrios on crushing, but at the same time it was found that *V. cholerae* had died out of the sand bed from which the larva had been taken. Flies on emerging from the pupae were immediately chloroformed and washed and crushed as the pupae had been, care being taken that the sand had been kept infected with cholera vibrios. On crushing, the flies gave *V. cholerae* cultures.

Adult flies were given access to both faeces and cholera culture for 14 hours; they were then kept in glass flasks and subsequently examined for the comma bacillus. Ten hours after feeding a fly proved to be infected with *V. cholerae* externally and probably internally as well; after 24 hours only internally were vibrios found and after 34 hours not at all.

H. S.

Greig (E. D. W.). **The Vibricidal Power of the Bile of Animals after Administration of Hexamethylene Tetramine and its Compounds.** —*Indian Jl. Med. Research.* 1915. Apr. Vol. 2. No. 4. pp. 907–925.

In an attempt to apply chemotherapy to the cure of cholera carriers, the author selected urotropine and its two compounds, new urotropine or helmitol, and cystopurin. Rabbits received large doses by means of a stomach tube and on dying or being killed the bile was removed and examined. Helmitol appeared to be the most toxic. Notwithstanding the alkalinity of the bile helmitol, in the one sample that was examined chemically, was found to have split up and liberated formaldehyde. The results obtained in the examination of the disinfecting properties acquired by the bile of treated animals are shown in the following three tables.

TABLE VII.—Helmitol. [GREIG (E. D. W.).]

Periods after mixing when samples were taken from the dilution.	Number of colonies of cholera vibrio furnished by 5 c.mm. of the following dilutions in bile of animals untreated, and treated with helmitol :—					
	1–1,000.		1–10,000.		1–100,000.	
	Bile of untreated animal.	Bile of treated animal.	Bile of untreated animal.	Bile of treated animal.	Bile of untreated animal.	Bile of treated animal.
1. Immediately	Numerous (about 1,660)	75	..	..	..	..
2. After 25 minutes	..	80	..	..	..	..
3. ,, 60 ,, ...	..	..	..	..	..	..
4. ,, 22½ hours	Very numerous.	..	..	..	..	..
1. Immediately	..	..	146	5	..	..
2. After 20 minutes	..	..	..	..	..	..
3. ,, 60 ,, ...	..	..	130	..	..	..
4. ,, 85 ,, ...	..	..	..	..	..	..
5. ,, 22½ hours	..	..	Very numerous. Uncountable	..	..	..
1. Immediately	..	..	..	..	10	1
2. After 35 minutes	..	..	..	..	12	..
3. ,, 60 ,, ...	..	..	..	..	12	..
4. ,, 85 ,, ...	..	..	..	..	..	..
5. ,, 22½ hours	..	..	..	..	13	..

TABLE VIII.—Urotropine. [GREIG (E. D. W.).]

Periods after mixing when samples were taken from the dilutions.	Number of colonies of cholera vibrio furnished by 5 c.mm. of the following dilutions in bile of animal untreated, and treated with urotropine.					
	1–1,000.		1–10,000.		1–100,000.	
	Bile of untreated animal.	Bile of treated animal.	Bile of untreated animal.	Bile of treated animal.	Bile of untreated animal.	Bile of treated animal.
1. Immediately	..	..	..	..	..	..
2. After 30 minutes	..	..	..	..	..	..
3. ,, 60 ,, ...	Very numerous. Uncountable	22	..	..	..	..
1. Immediately	..	..	129	48	..	..
2. After 30 minutes	..	..	134	38	..	..
3. ,, 60 ,, ...	..	..	104	68	..	..
4. ,, 23 hours	..	..	Very numerous.	3	..	..
1. After 23 hours	..	..	..	..	53	..

TABLE IX.—Cystopurin. [GREIG (E. D. W.).]

Periods after mixing when samples were taken from the dilution.	Number of colonies of cholera vibrio furnished by 5 c.mm. of the following dilutions in bile of animals untreated, and treated with cystopurin :—					
	1–1,000.		1–10,000.		1–100,000.	
	Bile of untreated animal.	Bile of treated animal.	Bile of untreated animal.	Bile of treated animal.	Bile of untreated animal.	Bile of treated animal.
1. Immediately	311	181	..	..	..	..
2. After 60 minutes	257	154	..	..	..	..
3. ,, 24 hours	Very numerous. Uncountable	23	..	..	..	..
1. Immediately	..	..	30	41	..	..
2. After 60 minutes	..	..	54	34	..	..
3. ,, 90 ,, ...	..	..	55	34	..	..
1. Immediately	..	..	..	..	3	2
2. After 60 minutes	..	..	..	..	3	..

In his consideration of the results the author remarks "it will be seen that the bactericidal power of the bile of animals after administration of helmitol and urotropine is well marked in respect of the cholera vibrio. It would appear from the experiments that the bile of the treated animal must remain in contact with the vibrios for some time to effect their complete destruction." Watery solutions of these drugs acting directly on the cholera vibrio are disinfectant only in the case of helmitol. The presence of normal bile does not influence this action, so that one may conclude that any quantity reaching the gall bladder will retain its full effectiveness. The author suggests the use of the drug from early convalescence onwards in cholera and that it may also be the means of preventing the carrier condition after other diseases such as typhoid.

H. S.

GREIG (E. D. W.). **On the Production of Gall-stones in Rabbits following Intravenous Inoculations of Cholera-like Vibrios.**—*Indian Jl. Med. Res.* 1915. Oct. Vol. 3. No. 2. pp. 259–265. With 1 coloured plate.

An account of two rabbits inoculated intravenously for long periods (three and six months) with cholera-like vibrios, one isolated from the stool of a case of cholera, the other from water. Both rabbits died and showed at post-mortem distended gall-bladders full of minute calculi and in the case of the rabbit inoculated for six months a large calculus blocked the mouth of the cystic duct. In each case the respective cholera-like vibrio was isolated in pure culture from the gall bladder and, seeing that the last inoculation had taken place about six weeks before death, each animal must be said to have become a carrier.

H. S.

MCLAUGHLIN (Allan J.). **The Control of Asiatic Cholera on International Trade Routes.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1916. Jan. Vol. 3. No. 7. pp. 392–399.

In the main an account of the methods adopted in American ports for the examination of suspected cholera carriers. The specimens are secured (except in the case of children and those with diarrhoea where a rectal tube with several "eyes" serves) by the administration of a saline purge. There follows the usual inoculation into peptone water with incubation for six hours, a sub-culture on further peptone water being carried out if the specimens cannot be examined before eight hours. Smears are made and stained with fuchsin and those showing curved vibrio-like rods indicate which specimens are to be plated. The agglutination test is the final one and is carried out direct from the culture on the agar plate. Two new media in place of peptone water, suggested by GOLDBERGER, are approved of by the author as allowing of relatively large sowings of faeces and as favouring the multiplication of cholera vibrios while restraining that of the ordinary faecal bacteria; they are an alkaline egg peptone and an alkaline meat infusion peptone. [No further details given.]

H. S.

CARTRON. **Note sur le fonctionnement des "Postes de Savonnage" dans la province de My-tho.**—*Bull. Soc. Méd.-Chirurg. Indochine.* 1915. July. Vol. 6. No. 7. pp. 241–245.

The French authorities in My-tho (Cochin-China) decided to provide the means by which the natives would be able to wash their hands in a disinfectant on leaving houses suspected of harbouring cholera patients or carriers and before taking meals, in particular funeral meals, hoping in this way to limit the spread of the disease; the inhabitants and local chiefs throughout the province were made acquainted with the necessary hygienic measures and "washing stations" were placed at the doors of infected houses; a "washing station" consisted of a supply of soap and of potassium permanganate solution (1 gm. to 10 litres) in an empty petrol tin fitted with a bamboo spigot, and was so inexpensive that they could be provided in great numbers and were kept before the houses eight days after the death or recovery of the cholera cases. The method was considered efficacious in that the epidemic, though not checked altogether, was considerably milder than in previous years. It was observed that no two consecutive cases occurred in a house where a washing station had been established, nor in such a house had burial ceremonies led to a spread of the disease. In the military barracks, prison and hospital good results followed this precautionary measure, while on the other hand in the hospital for incurables, where the instructions were neglected, a series of cases developed.

H. S.

DETRE (Ladislaus). **Ueber die Bekämpfung der Choleraepidemie in provisorischen Kriegsgefangenenlager zu K.-S.** [Measures taken against a Cholera Epidemic in Temporary Prisoners' Barracks in K.-S.]—*Wien. Klin. Woch.* 1915. Oct. 7. Vol. 28. No. 40. p. 1097.

The most important feature was the questioning of the prisoners as to the number of stools passed on the previous day and the segregation of those who had had more than one. Of the 4,000 prisoners in the camp 91 had had two stools and 27 had had three or more. In 36 hours bacteriological examination proved the presence of *V. cholerae* in 5·8 per cent. of the 91 men and in 44·4 per cent. of the 27 men. Of these 17 infected persons five subsequently developed cholera. No further cases occurred in the camp after the segregation of the suspected. The epidemic broke out on the 16th June; segregation took place on 26th June. Twenty-three cases occurred in all with a mortality of 65·2 per cent.

H. S.

FAICHNIE (N.). **Gastric Juice and the Prevention of Enteric Fever and Cholera.**—*Jl. R. Army Med. Corps.* 1915. Sept. Vol. 25. No. 3. pp. 351–353.

A plea for the recognition of stomach acidity as a bar to cholera infection, with the natural corollaries that liquids which are bacteriologically suspicious should not be drunk on an empty stomach, but in small quantities after meals, so that the sterilising effect of the

hydrochloric acid may act for as long as possible and that liquids which are above suspicion should be drunk before meals, so that the stomach acidity may not be lowered by dilution during the digestion of possibly contaminated food. H. S.

GELARIE (A. J.). **Vitality of the Cholera Vibrio in the Water of New York Bay.**—*Med. Record.* 1916. Feb. 5. Vol. 89. No. 6. Whole No. 2361. pp. 236–239.

To help decide whether the possible throwing of cholera carrier stools into the harbour of New York would constitute a danger to that city, the author undertook experiments on the viability of various cholera strains in New York bay and other waters, sterilised and unsterilised. The waters were infected with agar grown cultures and plates made from time to time to establish the presence or absence of *V. cholerae,* the water, 200 cc. in amount, being kept at room temperature and in the dark. The following table gives a summary of the results :—

TABLE VII.—Comparative Viability of Various Strains.

Strain.	Nature of the Water.	Number of Vibrios. added.	Period of time they lived.
Laboratory strain	Sterile bay water	149,500	154 days
A	Native bay water	149,500	21 days
	Sterile tap water, Staten Island.	149,500	18 days
	Native tap water, Staten Island.	149,500	3 days
B	Sterile bay water	4,000,000	285 days, still living.
Museum Natural History ..	Native bay water	4,000,000	7 days
	Sterile ocean water	4,000,000	285 days, still living.
	Native ocean water	4,000,000	7 days
	Sterile tap water, Brooklyn.	4,000,000	1 day
	Native tap water, Brooklyn.	4,000,000	1 day
Egypt	Sterile bay water	60,000,000	190 days, still living.
	Native bay water		47 days

In one case sterilized bay water, low tide, was inoculated with 160 million *B. coli* and 4 million *V. cholerae* together. *B. coli* died in three days ; *V. cholerae* was alive at the end of 285. H. S.

GIOSEFFI (M.). **Se e como un mercato possa essere o divenire centro o veicolo d'infezione colerica.** [Markets as Centres of Cholera Infection.]—*Gaz. d. Osp. e. d. d. Clin.* 1915. Sept. 29. Vol. 36. No. 66. pp. 1026–1029.

On examination of some 19 cases of a small epidemic in Trieste, it was seen that in a relatively short space of time the cases occurred in the most scattered quarters of the town. Neither the water nor the milk supply, neither the railway nor the port traffic could be held responsible for the outbreak; the cases could not be brought into direct relationship with one another or with cases occurring elsewhere; it was possible however to trace to some extent a course of infection to a canalside market place where vegetables were sold and where the author felt justified in surmising a carrier or carriers must have been the centre of infection.

H. S.

ROGERS (Leonard) & SHORTEN (A. J.). **The Alkalinity of the Blood in Kala Azar and Cholera, and the Technique of its Estimation.**—*Indian Jl. Med. Res.* 1915. Apr. Vol. 2. No. 4. pp. 867–881.

The work was undertaken by the authors to determine the extent in various cases of cholera of the acidosis which is regarded as the chief factor in the development of choleraic uraemia, and to decide as to the need of alkaline injections and the time of their administration.

WRIGHT's titration method was used for the determination of the alkalinity of the serum, it being argued that although in many ways the electrical estimation may be superior, it is much too complicated for a necessarily large series of cases, and that anyhow a deviation from the normal as recorded by the titration method must denote a very considerable alteration in the chemical constitution of the blood. Only 20 cases of cholera had been examined before the research was interrupted by the war; they are fully recorded in the table.

A diminished alkalinity of the serum is here seen to be a constant occurrence in all cholera cases and is very marked in those which were uraemic and fatal. No case whose alkalinity sank below $\frac{N}{80}$ recovered.

It would seem that unless the sodium bicarbonate injections be administered early and before the alkalinity has sunk too low one may not expect recovery. Any cases coming for treatment late and with suppression of urine should be given alkali at once. If the specific gravity of the blood is low the authors recommend giving the 2–3 per cent. sodium bicarbonate solution per rectum or subcutaneously; if the specific gravity is high or almost normal, intravenously with subsequent rectal injections.

H. S.

ROGERS (Leonard). **The Further Reduction of the Mortality of Cholera to 11 per cent. by the Addition of Atropine Hypodermically to the Hypertonic and Permanganate Treatment with an Addendum summarising the System of Treatment.**—*Indian Med. Gaz.* 1916 Jan. Vol. 51. No. 1. pp. 7–11.

The author follows up his first report [this *Bulletin*, Vol. 6, pp. 484–489] on the use of atropine in cholera by a second one, being now

TABLE III.—

Number.	Age.	Duration before admission.	Specific Gravity of Blood.	Blood pressure in millimetres.	Number of Transfusions.	Pints of 2% Sodium Bicarbonate injected.	Alkalinity before Transfusion.	Alkalinity after Transfusion.	Days. 1	2
1	30	7 hours	1053	75	..	..	..	..	18	N/40 56
2	40	4½ ,,	1052	95	..	..	..	..	N/40 4	N/40 Free
3	17	6¼ ,,	1063	0	1	..	N/50	N/60	48	33
4	12	9 ,,	1059	0	1	..	..	..	12	N/70 2+52
5	40	7 ,,	1058	75	1	..	..	..	0	N/60 72
6	32	24 ,,	1060	0	1	..	N/45	N/50	16	62
7	18	5 ,,	1062	0	1	Per Rectum	N/60	N/75	6	N/45 +12
8	55	65 ,,	1056	80	1	2. I.V.	N/65	N/35	* 0	N/35 6+42
9	32	9 ,,	1056	78	1	2. I.V.	N/60	N/32·5	* 0+20	24
10	40	26 ,,	1065	85	..	1. I.V.	N/52·8	N/52·8	11	36
11	23	10 ,,	1067	30	3	..	..	..	37	N/80 36
12	24	4½ ,,	1057	73	3	..	..	..	N/45 34	48
13	40	28 ,,	1066	40	2	3. I.V.	..	..	0	36
Cases ending fatally :—										
14	40	8 hours	1064	30	2	..	..	..	0	N/80· 0
15	65	4 ,,	1061	0	4	..	..	..	0	N/160 0
16	30	19½ ,,	1067	0	3	1. I.V. (3%)	..	..	1	5
17	31	22 ,,	1064	0	4	1. I.V.	..	..	4½	N/80 8
18	30	22 ,,	..	..	1	1 Subcutaneous	..	..	44	6
19	50	32 ,,	1048	90	..	1 Subcutaneous	..	..	5	?
20	30	6 days	1054	110	1	1. I.V.	..	..	0	N/240 0

I.V.—Intravenous Inje

Alkalinity of Blood in Cholera.

Alkalinity of Blood. Urine in ounces daily.					Progress of Blood Pressure.	Result.	Remarks.
3	4	5	6	7			
N /45 Free	..	..	..	..	102	Rec.	Mild.
..	..	..	..	..	100	,,	,,
48	..	..	..	..	85	,,	Typical Collapse.
33	Free	N /45 Free	..	..	75–100	.	.
Free	..	..	..	..	102	..	.
N /50 Free	..	..	..	..	90	,,	.
N /32·5 25	Free	..	..	..	95	.	..
67	..	..	..	..	87	..	
42	..	..	..	..	75–100	..	..
* 6	46	..	..	..	100–110	,,	,
37	N /50 +24	..	..	..	92–108	,,	..
18½	Free	..	..	..	85–92	,,	..
24	N /80* 13½	2+21	66	N /60 Free	102–125	,,	,,
..	..	..	..	..	30–80	Died	Collapse.
..	..	..	..	..	0–70	,,	,,
N /100* 0	0	0	N /00 0	..	55–85	,,	Uraemia.
* 14	21	N /80 24	44	N /50 Free	30–95	,,	Sloughing Bed Sores.
1	0	0	N /120 S	8 days N /45 Free	80–100	,,	Gangrenous Bullet Wound.
17	N /120 6	N /120 *0	N /80 0	N /55 0	N /30 90–150 T	,,	
N /120 0	..	..	..	..	110–125	,,	Late admission.

ction. *Days' Alkaline Injections given.

able to compare 100 cases so treated with 100 unselected and alternative untreated ones; the time taken in collecting the cases was about a year and so included all the seasons with their corresponding mortalities.

The severity of the cases in the two groups was compared by tabulating them and proved to be about equal. Pulseless cases and those with blood of very high Sp. gr. (over 1,065) were found to be represented fairly evenly in the two groups and their ages were nearly equal; the mortality however when atropine was included in the therapy was 11 per cent. as against 22 per cent. when it was not.

Collapse, uraemia and pneumonia are the causes of death against which the remedy appears chiefly to work, as shown by Table III.

Table III.

The causes of death in the two series of cases.

	Collapse.	Uraemia.	Pneumonia.	Other causes.	Total.
Atropine ..	3	4	1	3	11
No Atropine ..	9	5	6	3	23

The blood pressures in the group treated with atropine were higher than those in the one without; the respirations were diminished—both good prognostic signs.

Table IV.

Blood pressure on the day after admission.

	Atropine.				No Atropine.			
Blood pressure.	Cured.	Died.	Total.		Cured.	Died.	Total.	
To 70 mm. ..	2	2	4		2	4	6	
71– 80 mm. ..	4	2	6		9	1	10	
81– 90 mm. ..	21	5	26		22	4	26	
91–100 mm. ..	35	0	35	54 (55·7%.)	22	3	25	34 (37·3%.)
101–110 mm. ..	19	0	19		11	0	11	
111–120 mm. ..	6	0	6		7	2	9	
Over 120 mm. ..	1	0	1		3	1	4	
Total ..	88	9	97		76	15	91	

TABLE V.

Respiration rates on day after admission.

Rates per minute.	Atropine.			No Atropine.		
	Cured.	Died.	Total.	Cured.	Died.	Total.
To 20 ..	6	0	6 } 60	3	0	3 } 47
21 to 25 ..	52	2	54	39	5	44
26 to 30 ..	29	2	31	29	5	34
31 to 40 ..	1	4	5 } 7	7	2	9 } 12
Over 40 ..	1*	1	2	0	3	3
Total ..	89	9	98	78	15	93

* 11 given in the original; no doubt a misprint.

The pulse rate did not appear to be materially altered by the giving of atropine, nor was the vomiting reduced. The author, however, does not find vomiting frequent or of importance when hypertonics are injected and permanganate administered. A somewhat greater flow of urine, no doubt due to the higher blood pressure, is noted to result from the use of atropine.

A very useful, complete and concise summary of the author's method then follows.

H. S.

SINTON (J. A.). **Results of the Treatment of 69 Cases of Cholera by Rogers' Method.**—*Indian Med. Gaz.* 1915. Aug. Vol. 50. No. 8. pp. 281–286.

At Kohat, North-west Frontier Province, during August and September of 1914, a series of severe and unselected cases, 38 in number, was treated according to ROGERS with hypertonic injections, permanganate pills and such drugs as adrenaline, pituitrin and strychnine to combat collapse and suppression of urine, together with cuppings over the kidneys and hot fomentations. The mortality amongst these severe but treated cases was 37 per cent. as compared with a mortality of 83·4 per cent. amongst all the untreated during the same period. A quicker and easier method of giving an intravenous injection than the one of using a needle and inserting it directly into a vein is said by the author to be that of making a $\frac{1}{2}$–$\frac{3}{4}$ inch incision alongside the vein and, after dissecting this out, of thrusting a pair of forceps, edges uppermost, underneath to serve as a means of compression for the vein above and below the point of insertion of the canula, and at the same time to lift the vein up out of the wound and render it accessible.

H. S.

VALK (Wilh.) **Enkele aanteekeningen over de cholera-patienten behandeld in het Stadsverband te Batavia 1914.** [Some Notes on Cholera Patients treated in the Batavia District during 1914.]—*Geneesk. Tijdschr. v. Ned. Ind.* 1915. Vol. 55. No. 5. pp. 561–566.

A short account of the application of the usual therapy in some 115 cases of cholera. An urticarial erythema was observed in eight of the cholera patients but also in other cases treated with hypertonic saline injections and not diagnosed bacteriologically as cholera even after repeated examination. A case with cholecystitis necessitating the opening of the gall bladder is described. *V. cholerae* was obtained from the bile in pure culture and did not disappear from the secretion till between the 4th and 8th week after operation. The stools remained free from the comma bacillus.

H. S.

STRAUSS (H.). **Zuckerinfusionen bei Cholera.** [Saccharine Injections in Cholera.]—*Therap. d. Gegenwart.* 1915. Oct. Vol. 56. No. 10. pp. 370–373. With 2 text-figs.

As sodium chloride in large quantities does harm to already damaged kidney epithelium, and as glucose has been shown by KAUSCH, who for nutritive purposes gave 5–10 per cent. glucose solution in amounts of 1,000 cc. once or twice a day, to be well borne when injected intravenously, the author advises the use of glucose isotonic ($4\frac{1}{2}$ per cent.) injections in cholera. Hypertonic glucose solution would, he thinks, have only a temporary influence, the sugar being soon removed by the tissues. He hopes that under this treatment the renal conditions may show improvement, which according to RUMPF and others they did not do when saline injections were used.

H. S.

PETROVITCH. **Sur les bons effets de la bactériothérapie spécifique dans le choléra au cours de la Campagne de Serbie (1914).**—*Bull. Acad. Med.* 1915. Aug. 10. Vol. 74. No. 32. pp. 185–188.

A short account of treatment tested in Serbia in August 1914. Slight cases (1,153) were given small doses of cholera vaccine daily till the diarrhoea ceased (generally on the 2nd–16th day).

Medium cases (90) received the cholera vaccine in quantities of normal serum from 10–100 cc. intravenously, sometimes as often as twice or thrice a day.

Severe cases (157) were treated like the medium ones but received the vaccine in 500 cc. saline solution. The author decides that the administration of cholera vaccine was beneficial, the 90 medium cases all recovering while 95 similar ones under ordinary treatment showed a mortality of 9·4 per cent., and the 157 severe cases having a mortality of 14·4 per cent. against one of 58 per cent. for 120 severe cases not given vaccine treatment. [The conclusions are unconvincing owing to a lack of detailed information.]

H. S.

CASTELLANI (Aldo) & MENDELSON (Ralph W.). **Note on the Tetravaccine: Typhoid + Paratyphoid A + Paratyphoid B + Cholera.**—*Brit. Med. Jl.* 1915. Nov. 13. pp. 711–713.

The special feature of this mixed vaccine is that the 0·5 per cent. phenol, present here as in most vaccines, is relied upon to effect the killing of the organisms, no heating of the vaccine taking place at all. The cultures were usually grown on agar but occasionally peptone water was used. The 0·5 per cent. phenol was found to sterilise within a few hours at 10°–20° C. The dosage was, particularly for *V. cholerae*, a smaller one than usual, as the vaccine was mixed so as to give :—

Typhoid	500	million per cc.
Paratyphoid A	250	,, ,,
Paratyphoid B	250	,, ,,
Cholera	1000	,, ,,

and of this 0·5 to 0·6 cc. was given as a first dose and repeated at intervals of a week as a second and possible third dose.

Three individuals inoculated with this vaccine gave the following agglutination results (see table, p. 257).

These titres are declared to be practically identical with those obtained in control persons inoculated with corresponding single vaccines.

H. S.

SCHMITZ (K. E. F.). **Ueber einzeitige Immunisierung mit Typhus- und Cholera-Impstoff (Mischimpstoff).** [Immunisation with a Mixed Typhoid and Cholera Vaccine.]—*Berlin. Klin. Woch.* 1915. May 31. Vol. 52. No. 22. pp. 572–574.

Using a vaccine containing ½ loop typhoid culture and 2 loops cholera culture per cc., the author inoculated three men and two women as follows :—The men received 0·8, 1·6 and 2·0 cc., the women 0·7, 1·4 and 1·8 cc., one week elapsing always between the inoculations ; the reaction was of the mildest. None of the persons had had typhoid or cholera previously and no one's serum contained typhoid or cholera agglutinins before inoculation. In 3–5 weeks after the third inoculation the typhoid and cholera titres reached in every case between 1/10,000 and 1/20,000.

Nine soldiers inoculated elsewhere against cholera and typhoid with *other* vaccines and *separately* were examined for comparison ; when tested at periods varying from three weeks to three months subsequent to inoculation they could show no titre for cholera higher than 1/800 and for typhoid than 1/1000.

The author considers the greatly superior results obtained by him to be due probably to the fact that the strains used were better ones for immunising purposes or (less probably) to a greater stimulation to antibody production resulting when two bacteria are inoculated simultaneously ; this latter alternative received some support when it was seen that two persons inoculated with the author's typhoid vaccine only showed typhoid titres of merely 1/800 and 1/3000 three weeks after the third inoculation.

It should be mentioned that agglutination was carried out in all cases with a strain other than the one used for inoculation. It was

[Castellani (A.) & Mendelson (R. W.).]

Blood Examination of Three Persons inoculated with the Tetravaccine (two inoculations: ½ cc. first, ½ cc. second).

Individuals Inoculated.	Blood tested against	Limits of Agglutination. Weeks after first Inoculation.					
		1	2	3	4	5	6
No. 1 ..	*B. typhosus*	1/20	1/1200	1/400	1/300	1/151	1/150
	B. paratyphosus A	1/20	1/300	1/200	1/150	1/100	1/60
	B. paratyphosus B	1/20	1/200	1/200	1/200	1/150	1/80
	V. cholerae	1/10	1/100	1/100	1/80	1/80	1/60
No. 2 ..	*B. typhosus*	1/40	1/800	1/300	—	1/200	1/100
	B. paratyphosus A	1/20	1/200	1/150	—	1/100	1/100
	B. paratyphosus B	1/20	1/150	1/100	—	1/80	1/60
	V. cholerae	1/20	1/40	1/40	—	1/20	1/20
No. 3 ..	*B. typhosus*	1/40	1/1000	1/4000	1/200	1/100	1/80
	B. paratyphosus A	1/20	1/250	1/200	1/150	1/80	1/60
	B. paratyphosus B	1/10	1/200	1/150	1/150	1/100	1/60
	V. cholerae	1/10	1/100	1/40	1/20	1/20	1/20

noticed that of the five persons inoculated with typhoid and cholera simultaneously, the two who had had paratyphoid B fever six and seven years previously, starting with paratyphoid B titres of 1/100 and 1/50, developed ones of 1/5000 and 1/1000. The remaining three persons, who had not had paratyphoid fever, did not agglutinate *B. paratyphosus* B before inoculation and did so only in titres of 1/30, 1/100 and 1/500 after inoculation.

H. S.

von Liebermann (L.) & Acél (D.). **Simultanimpfungen gegen Typhus und Cholera.** [Mixed Cholera and Typhoid Vaccines.]—*Deut. Med. Woch.* 1915. Oct. 14. Vol. 41. No. 42. p. 1243.

As an explanation of the tables which give the results of work done to establish the validity of mixed cholera and typhoid vaccines, it is necessary to add that the inoculations were subcutaneous and given on three successive days, the dosage for typhoid being 0·5, 1·0 and 2·0 loops respectively, for cholera 0·6, 1·2 and 2·4 loops, for typhoid+cholera the same quantities given together. The bactericidal titre was established according to Stern and Korte and was the smallest quantity of serum which in 1 cc. of physiological saline containing 0·1 cc. of an emulsion of the organism in question and a certain quantity of complement, markedly lowers the numbers of bacteria which grow on plating, as compared with control plates (see page 259). [The uniformity of the figures given in the tables is surprising, to say the least of it.]

Bujwid (Odo). **Die Erzeugung der Impstoffe und Massenimpfungen in Krakau gegen Cholera und Typhus in der Zeit des Krieges 1914-15.** [The Preparation and Inoculation of Typhoid and Cholera Vaccines in Cracow during 1914–15.]—*Med. Klinik.* 1915. Dec. 26. Vol. 11. No. 52. pp. 1421–1423. With 1 fig.

A method of standardising vaccines more efficiently than counting is described. [No comparative details given.] It consists in weighing a culture before and after removing a small amount (5–12 mg.) on a fine glass rod. This small amount is then emulsified in 10 cc. saline; the remainder of the agar slope culture is emulsified also and a sample taken up in a graduated 1 cc. pipette and dropped into 10 cc. fresh saline till the opacity produced equals that of the weighed and already emulsified portion. A knowledge of this weight and of the various quantities employed allows of the strength of the emulsion prepared from the agar slope being worked out in terms of milligrams. The author kills both cholera and typhoid vaccine with ·5 per cent. phenol and employs no heat at all. His first dose for cholera is 2 mg., double that being given five days later. The reaction was unimportant, only in 3–5 per cent. did diarrhoea and more seldom still vomiting occur. The author considers the prophylactic cholera inoculation to have been very effective. The mortality among the uninoculated cases was 40–50 per cent., while of the 63 inoculated cases four (6·3 per cent.) died and these four had been inoculated only once. In Cracow itself no cases occurred among the civil population.

H. S.

Agglutination and Bactericidal Titre with *B. typhosus.* [von LIEBERMANN (L.) & ACÉL (D.).]

Serum of Rabbits Inoculated with :—	Agglutination-titre.			Bactericidal titre.		
	Before Inoculation.	7 days after Inoculation.	28 days after Inoculation.	Before Inoculation.	7 days after Inoculation.	28 days after Inoculation.
B. typhosus	..	1 : 4000	1 : 8000	0·001	0·0000001	0·000001
,, ...	..	1 : 4000	1 : 8000	0·001	0·0000001	0·000001
,, ...	..	1 : 4000	1 : 8000	0·001	0·0000001	0·000001
B. typhosus + *V. cholerae* ..	..	1 : 4000	1 : 8000	0·001	0·0000001	0·000001
,, ...	..	1 : 4000	1 : 8000	0·001	0·0000001	0·000001
,, ...	..	1 : 4000	1 : 8000	0·001	0·0000001	0·000001

Agglutination and Bactericidal Titre with *V. cholerae.*

Serum of Rabbits Inoculated with :—	Agglutination-titre.			Bactericidal titre.		
	Before Inoculation.	7 days after Inoculation.	28 days after Inoculation.	Before Inoculation.	7 days after Inoculation.	28 days after Inoculation.
V. cholerae	..	1 : 2000	1 : 4000	0·01	vibrios were killed by the sera in every dilution.	
,, ...	..	1 : 2000	1 : 4000	0·01		
,, ...	..	1 : 2000	1 : 4000	0·01		
B. typhosus + *V. cholerae* ..	..	1 : 2000	1 : 4000	0·01		
,, ...	..	1 : 2000	1 : 4000	0·01		
,, ...	..	1 : 2000	1 : 4000	0·01		

SEIFFERT (G.). **Kombinierte Schutzimpfung gegen Typhus und Cholera.** [Simultaneous Inoculation for Typhoid and Cholera.]—*München. Med. Woch.* 1915. Nov. 23. Vol. 62. No. 47. pp. 1617–1619.

A combined typhoid and cholera vaccine was given to some 250 men. No complications. Reactions not more pronounced than when single vaccines were inoculated.

Twenty-five sera were examined before and at various stages after the giving of the vaccine for the presence of agglutinins, bacteriolysins, bacteriotropines, complement-fixing and growth-inhibiting bodies. In every case it was seen that the mixed vaccine had given the same result as if typhoid and cholera vaccines had been given separately. [That is to say qualitatively; no control experiments were carried out to give an idea of the quantitative relationship.] The growth-inhibiting bodies referred to were found by the author to exist in normal sera, but to disappear specifically from the sera of convalescents and inoculated; the test is carried out by inoculating 0·5 cc. inactivated serum before and after inoculation with the organism in question, incubating for 12 hours at 37° and sowing a loopful in agar plates to determine whether inhibition has taken place or not.

H. S.

von WASSERMANN (A.) & SOMMERFELD (R.). **Experimentelle Untersuchungen über die Wirksamkeit der Typhus- und Choleraschutzimpfung.** [An Experimental Study of the Efficacy of Typhoid and Cholera Inoculation.]—*Med. Klinik.* 1915. Nov. 28. No. 48. pp. 1307–1310.

Taking into consideration that cholera as a disease originates in the intestinal epithelium, subcutaneous and intravenous inoculation not causing cholera as such, the authors wondered if prophylactic inoculation confers its immunity by reason of the resulting increase of anti-bodies in the blood. The idea in their experiments was to take animals which could not be infected with cholera organisms administered per os and see if the lowering of the general resistance by starvation and the removal of the anti-bodies pre-existent in the blood by the injection of B. Danyz would render the animals liable to invasion by *V. cholerae* given per os. Mice were starved for 24–48 hours before being inoculated subcutaneously with living B. Danyz, starvation being continued until the animals showed signs of illness when cholera vibrios were given by means of a stomach tube. On killing the following day cholera vibrios were found in the heart blood and various organs. Controls in which cholera organisms were put into the stomach without other treatment showed no vibrio infection. Similar results were obtained with *B. typhosus*; here however in place of a B. Danyz inoculation extract of typhoid bacilli was injected to remove anti-bodies from the blood. The authors claim to have proved that the resistance of the intestinal epithelium of mice to infection by cholera and typhoid bacteria is connected with the presence of anti-bodies in the blood.

[Controls establishing the effect of starvation alone on the lowering of resistance to infection and experimental evidence of a depletion of anti-bodies as a result of the preparatory treatment are not recorded.]

H. S.

MALARIA.

PUNJAB. **Report on Malaria in the Punjab during the Year 1914, together with an Account of the Work of the Punjab Malaria Bureau.** By Lieut.-Col. D. T. LANE, I.M.S., Chief Malaria Medical Officer, Punjab.—3 pp. With 3 maps and 3 charts. 1915. Lahore: Printed by the Superintendent, Govt. Printing, Punjab. [Price Rs.1–5–0. or 2*s*.]

This brief report is illustrated with three excellent maps and three charts, besides the necessary mortality-table.

The principal item of the text is a summary of a malaria-survey of Lahore, from which it is concluded that protection from malaria would not there be difficult or expensive. In Lahore—as indeed in the plains of India generally—water tends to stagnate alongside the lines of embankment of roads and railways. "There is a chain of pools along the sides of practically all the roads approaching Lahore." In one particular line of pools Anopheles larvae were found all the year round. The Chief Malaria Officer thinks all this foul and pestilent congregation of vapours might be made to blossom like the rose. "A rose-garden along the railways from Lahore to Mian Mir would probably return a handsome profit."

In rural districts dák-bungalows and rest-houses are considered to be nurseries of malaria, as the men in charge of them know nothing about extirpating the breeding-places of mosquitoes.

The prevention of malaria in the new canal-colonies of the Punjab is referred to, but no exact observations are here placed on record.

The need for inter-departmental co-operation is illustrated by the statement that in one important town the excellent practice of immunising school children by quinine was invalidated by the fact that for about half the malaria season the schools were closed for the holidays.

A table and a chart show that the total number of deaths from "fever" in the Punjab in 1914 was 345,471, or 17·86 per 1,000 of the population, and that the months of higher mortality were September to January, with a maximum in October, and those of lower mortality February to April, with a minimum in April; July and August were also below the mean of all months.

A map illustrating the local rates of mortality from "fever" shows that the worst districts are generally those to the west of the province, between the Indus and Jhelum, and those to the extreme east, between the Jumna and the Ghagger (which dies in the Bikanir Desert); while the least fatal—leaving the exceptionally-situated Simla district out of the account—are the districts of Ferozepore and Ludhiana, which lie between the basins of the Indus-system and the Ganges-system. The worst districts of all are Muzaffargarh (25·45 deaths per thousand of the population) which is impacted between the Indus and the Jhelum-Sutlej, and Karnal (23·7 per 1,000) which is situated between the Ghaggar and Jumna.

The two maps showing the local spleen-indices of school children in July and November, respectively, when compared with the map of local rates of mortality from "fever," though they exhibit a general concordance between the degree of spleen-affection and the degree of fever-mortality, yet reveal some remarkable incongruities, which may,

perhaps, be worth investigating. For instance, in the district of Lyallpur, where the death-rate from fever is one of the lowest, the spleen-index is one of the very highest, and a similar though not so strongly-contrasted, relation between the two phenomena appears in the contiguous districts to the north and the south.

The two charts showing the mortality year by year (1) from all causes and (2) from "fever" from 1867 to 1914 would, for syllogistic purposes, have been more useful if the annual deaths in each case could have been reduced to a common ratio. However, taking no more than is set down for them, the figures show—and it cannot but make the judicious grieve—that every year from 1867 to 1900, when plague began to compete, more people died of "fever" in the Punjab than of all other diseases put together. The charts also show that in certain years, notably 1878–79, 1890, 1892, 1900, 1908, there was a sudden and enormous increase in the number of deaths from "fever." *Ex ungue leonem*—much of the evidence from the Punjab might be extended to the plains of India generally.

A. Alcock.

STRICKLAND (C.). **Certain Observations in the Epidemiology of Malarial Fever in the Malay Peninsula.—Federated Malay States.** No. 15 of 1915. Paper to be laid before the Federal Council by Command of H. E. the High Commissioner.

The author of this memorandum, revolving—it may reasonably be supposed—in his doubtful mind the sayings of Herodotus concerning the mutability of human affairs and the jealousy of the powers above, has decided to make public a hypothesis which he thinks can be verified though he admits that it lacks proof. It is that in the hills of the Malay Peninsula land that has been opened up for plantation and settlement becomes malarious if the ravines and valleys are cleared, but is not malarious if the ravines and valleys are left in their natural virgin state.

The hypothesis is countenanced by some epidemiological observations that certainly are suggestive, and by some entomological investigations which in the present state of the hypothesis are even more impressive.

The epidemiological evidence, which is entirely empirical, is as follows:—

(*a*) Along 140 miles of a hill road there are, at intervals of a few miles, cooly-lines which in every case are surrounded by forest; a jungle stream runs in front of one of the lines. The coolies in these lines say that they never have had fever.

At one spot, along this stretch of road, where a large plantation has been opened up the coolies "were suffering considerably from fever."

(*b*) Kuala Lipis is a settlement where the European quarters are for the most part situated at the head of ravines that are densely overgrown with jungle. This settlement is generally considered to be so free from malaria that most Europeans discard mosquito-nets there.

(*c*) Kuala Lumpur is said by old inhabitants to have been healthy until the jungle in the ravines was cut down.

(*d*) On a certain estate "the health had been excellent" up to a time when all the ravines were cleared. Now the medical officer of the estate has ordered compulsory quinine.

According to the author's entomological observations no notorious malaria-carrying species of Anopheles exist in the swamps of ravines that are covered with virgin forest. The only species at all common in such situations is *Anopheles aitkeni*, which has never been known to enter houses or to leave the jungle at all.

On the other hand where such ravine swamps have been exposed by clearings for roads or settlements, then it is common to find *sinensis*, *albirostris*, *maculatus*, *karwari*, *fuliginosus*, *rossi*, and *kochi*, some of which are notorious as carriers of malaria.

The author is anxious that his hypothesis should be submitted to processes of exact proof, some part of which would be furnished by adopting his recommendations (*a*) that in opening up hill country the ravines should be left in their natural state right up to, and a few feet beyond, the crests of their slopes, and (*b*) that ravines where they have already been cleared should be allowed to revert to nature, or should be afforested by experts.

A. A.

STRICKLAND (C.). **Considerations regarding an Outbreak of Malaria at Morib, Federated Malay States.**—*Parasitology.* 1916. Jan. Vol. 8. No. 3. pp. 249–254.

The outbreak occurred at a seaside resort for Europeans, and the author had first to satisfy himself by an examination inclusive of all the elements of the local population, that malaria is there endemic. The local Anopheles mosquitoes were next collected, and were found to consist of five species, namely *ludlowi*, *rossi*, *umbrosus*, *sinensis*, and *tessellatus*, the first on the list being more than three times as numerous as all the others put together in a nine days' collection, and the two last being represented by one specimen of each. No evidence of infection was found in any of the specimens (80, 38, 13, 1, 1 respectively) investigated to that end, and in the absence of any such direct evidence the author concludes that most of the malaria at Morib must be attributed to *ludlowi*, as being by far the most abundant of the three out of the five species (the other two being *umbrosus* and *sinensis*) that have been proved to be carriers elsewhere in the Oriental region.

A. A.

MORRIS (Leslie M.). **Malaria in H.M. Ships "Hermione" and "Bristol" at Tampico, with Special Reference to Methods of Screening.**—*Jl. R. Naval Med. Service.* 1916. Jan. Vol. 2. No. 1. pp. 42–50. With a sketch map.

This paper gives *inter alia* an interesting account of measures taken to keep mosquitoes out of ships lying in a riverside port with malarial surroundings and in propinquity to a native quarter said to be "indescribably primitive." Anopheles swarmed. It was easy to make gun-ports, skylights, and ventilation-openings mosquito proof, but the screening of hatches presented difficulties, which were overcome

to some extent by fitting the screens with falling doors closing automatically by weights. The intakes to the fans were covered by a screen which was found to act as a mosquito-trap. Screening of course, particularly muslin, interfered with ventilation, and netting did not stand prolonged exposure to rain; in all respects wire-gauze is said to be preferable. Daily inspections were made to see that all screens were in repair and were in position before sunset. The ship was kept as dry as possible, so as to offer no encouragement to mosquitoes breeding, and was searched for mosquitoes every day. Officers were advised to use mosquito-nets; men had to sleep below, and were instructed to wear boots and keep trousers tucked inside socks after evening quarters.

For further protection quinine was issued in five-grain doses daily, and the intelligent and self-interested co-operation of the ships' company was enlisted by rational instruction.

Notwithstanding all these precautions, two separate outbreaks of malaria—benign tertain and subtertian, in the proportion of 4 to 1—occurred in the "Hermione," the number of cases being 51 and 55 respectively, in a ships' company of 325. Mosquito-nets were provided for the infected men, who were further isolated in a part of the ship which was fitted with extra screens to all openings and communications.

As a result of the experience gained in the "Hermione," the "Bristol," which relieved the former ship from England, had been adequately fitted with screens of copper-gauze in Portsmouth dockyard. Furthermore in the "Bristol" the preventive dose of quinine was increased every alternate evening by 5 grains; all men not on duty were required to be below, and behind screens, by 6 p.m.; the deck watch and signalmen wore helmets, veils, and gloves, and had their feet and ankles protected, and no lights were allowed on deck at night.

Notwithstanding, cases of malaria began on the 13th day after arrival, and altogether 95 cases occurred, in a ship's company of 375, in the course of about a month. The majority were youngsters straight from England, and the first infections were among ward-room domestics and cooks from the galleys on the upper deck.

In neither ship were any of the cases serious or complicated, a happy issue which is attributed to the regular quinine prophylaxis. Among the officers of the two ships there was only one case, this exemption being ascribed to the fact that the officers realized the value of mosquito-nets and quinine.

The author expresses the opinion that the moderate use of alcohol, after sunset, is auxiliary to preventive treatment.

[The effect of sea-air on the copper-gauze screens of the "Bristol" remains to be observed. In some tropical sea-ports metallic copper becomes corroded very quickly.]

A. A.

Bahrenburg (L. P. H.). **Malarial Fever. Recent Appearance at Galveston, Tex. (From a Report.)**—*U. S. Public Health Rep.* 1915. Dec. 17. Vol. 30. No. 51. pp. 3657–3658.

It has been stated that there are no indigenous Anophelines in the island of Galveston, and it is also asserted on competent authority, that prior to a big storm in August 1915 malarial infection of local

(autogenous) origin was extremely rare if not actually unknown. The neighbouring Texas coast, however, has long had a bad reputation for malaria.

It is suggested that the occurrence of malarial fevers in Galveston subsequent to this storm—many people who had not been on the mainland being severely affected—may be ascribed directly to storm-carried mosquitoes from the infected mainland, and that the continuance of infections in October and November must be due to these storm-borne mosquitoes having found suitable breeding-places in the island, though none such had been thought to exist.

As an *a priori* argument the theory is rational and highly probable, but the confirmatory facts of observation, which would be so interesting are wanting. Indeed the statement that immediately after the storm there was "almost a total absence of mosquitoes" for a week or ten days or *even longer*, if it be a correct expression of the facts, points to the existence of some special factor, or factors, that need to be adjusted with the theory.

A. A.

MITZMAIN (M. Bruin). *Anopheles punctipennis* **Say. Its Relation to the Transmission of Malaria.—Report of Experimental Data relative to Subtertian Malarial Fever.**—*U.S. Public Health Rep.* 1916. Feb. 11. Vol. 31. No. 6. pp. 301–307.

Anopheles punctipennis being a species of wide range in the United States, its exact position in relation to malaria is a question of great importance. Mr. Mitzmain, whose high reputation as an experimental pathologist has been established in several fields, found (*a*) no infection of stomach or salivary glands in any of 219 individuals of this species dissected 3 to 38 days after repeated feeds on patients whose blood contained crescents, and (*b*) that no infection of healthy human beings followed repeated and copious bitings from individuals of this species that had sucked blood containing crescents 4 to 33 days before (except in the case of one volunteer who was also bitten accidentally by an infected *A. quadrimaculatus*).

Control experiments with *Anopheles quadrimaculatus* and *A. crucians* resulted in 13·8 per cent. and 33·3 per cent. of transmitted infections, respectively, from those two species.

One of the volunteers, who submitted to 91 bites from *A. punctipennis* seems to have been Mr. Mitzmain himself.

A. A.

BARRET (Harvey P.). **Notes on the Breeding Places of Anopheles.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1916, Jan. Vol. 3. No. 7. pp. 406–410.

In the course of a mosquito-survey of Charlotte (North Caroline) and its vicinity conducted in the spring and summer of 1915 the larvae of *Anopheles punctipennis* were found everywhere—in muddy puddles and in water-butts as well as in ditches, streamlets, and the grassy selvage of large streams and creeks. No originality is claimed for observations which are known to apply to several other species of Anopheles in other lands.

A. A.

RIEGEL. **Halbmondfieber (Malaria tropica), erworben in Nordpolen.** [Malaria with Crescents acquired in North Poland.]—*München. Med. Woch.* 1915. Nov. 9. Vol. 62. No. 45. pp. 1534–1535. With 2 text-figs.

The paper records the case of a man who contracted malaria with typical crescents (shown in microphotographs) in North Poland, north of latitude 54° near Kalwaria in July 1915. He had resided in this district for four months before infection took place and previous to his journey there in January he had never left his home in Schleswig-Holstein, where he had never suffered from malaria. There seems little doubt that the author's conclusion is correct that infection took place in the locality indicated.

C. M. Wenyon.

SAINTON (Paul). **Les formes légères et méconnues du paludisme.**—*Bull. Acad. Méd.* 1915. Dec. 7. Ann. 79. Vol. 74. No. 49. pp. 700–703.

Remarks upon five cases from the army of France, in which malarial parasites were found in the blood, and which were cured at once by quinine, though the symptoms, so far from pointing to malaria, suggested gastro-enteritis, or even in one instance, dysentery. The men had been for a considerable time in the trenches, in a marshy part of Flanders, where mosquitoes were very abundant. Their homes were not situated in a malarial region, they had never been in the colonies, nor had they ever suffered from malarial fever before. Analogous cases, simulating gastro-enteritis but responsive to quinine, were afterwards noticed in the naval hospital at Cherbourg, though there the diagnosis of malaria was not confirmed by examination of the blood.

A. A.

BASS (C. C.) & JOHNS (F. M.). **A Method of Concentrating Malaria Plasmodia for Diagnostic and other Purposes.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. Nov. Vol. 3. No. 5. pp. 298–303. With 4 plates.

After more than three years' experience the authors have elaborated a method of concentrating plasmodia to aid diagnosis, as well as to collect large quantities for experimental purposes. The method depends upon the fact that a malaria plasmodium with its host erythrocyte is larger than the non-parasitized erythrocyte and that when centrifuged at proper speed the large cells rise to the top of the cell column. Most of the leucocytes are still larger than the parasitized cells and accordingly rise to a higher level still. In a tube properly centrifuged there are the following layers: leucocytes and serum, parasitized erythrocytes, and non-parasitized erythrocytes. The older and larger the parasites the more certainly do they collect on the top. This is true of crescents and other gametocytes, and tertian and quartan schizonts which are more than half grown. They rise more quickly than other smaller parasites. Many of the smallest sizes do not rise at all though large ring forms rise promptly. By proper technique 90 per cent. of all the plasmodia (except the smallest rings) can be collected from 10 cc. of blood and all placed upon one or two slides in the form of ordinary blood smears.

Technique.

Material required—

"1. A solution of 50 grams sodium citrate and 50 grams dextrose in sufficient distilled water to make a volume of 100 cc. Solution is aided by heat. Filter.

"*Apparatus required* :—

"1. All glass syringe, capacity 10 cc.

"2. A 1 cc. pipette graduated in hundredths.

"3. Plain test tubes (centrifuge tubes) 1·5 cm. inside × about 12 cm. Cornell centrifuge shields are necessary for these round bottom tubes. The conical centrifuge could be used.

"4. Plain test tubes 0·5 cm. inside × about 12 cm. We make these out of suitable glass tubing.

"5. Capillary pipettes large size. Inside diameter of capillary should be about 0·1 cm. These are made of suitable glass tubing.

"6. Capillary pipettes small. Outside diameter of tube should be less than inside diameter of large capillaries. These are made of suitable glass tubing.

"7. Rubber nipple.

"8. Glass cutting knife (or file).

"9. Electric centrifuge having a speed of 2,000 or more revolutions per minute."

Method.

Into a large tube measure 0·2 cc. of the citrate dextrose solution. Draw 10 cc. of blood with the syringe from a vein and put into the citrate dextrose solution at once and mix. Place equal quantities of this mixture in the large centrifuge tubes to depth of 2–5 cm. Centrifuge the tubes for the proper length of time. This varies for each centrifuge and can only be determined by experience. The authors' centrifuge ran at speed of 2,500 revolutions per minute and the distance from the centre to the end of tube was 18 cm. The proper length of time on the authors' machine is one minute for each cm. of blood in the tube. If the depth is $3\frac{1}{2}$ cm. the time is $3\frac{1}{2}$ minutes. All the plasmodia and the leucocytes rise to the top of the cell sediment and are in the first 0·1 cm. With a large pipette skim off as much of this layer as possible and place in one (or two) of the 0·5 cm. tubes. The contents must be properly mixed by drawing in and out of the pipette. The column in this tube must not be more than 5 cm. deep. Centrifuge as before. With large capillary tube draw not more than 5 cm. column of the cells into it from the surface of the cell column. It is a good plan to mix this well by forcing it in and out of the pipette on to a slide. Draw it into the pipette past the tip and seal in the flame. Cut off the capillary part containing the blood and centrifuge as before. After centrifuging there will be a grayish leucocyte mass merging into the column of erythrocytes. In very heavy infections the lower part of the leucocyte layer and the upper part of the erythrocyte column have a brownish appearance from the pigment in the parasites. Cut the capillary at a point about 0·1 to 0·2 cm. below the bottom of the leucocyte layer and with a small capillary draw out the small amount of erythrocytes and a little plasma to dilute them. Mix and make one or two blood spreads of the usual kind, which are stained and examined.

By a calculation based upon the quantity of blood required to make 100 blood films the authors find that one minute's examination of the film prepared by the centrifugation method yields the same result as 15 hours' examination of the ordinary blood film. C. M. W.

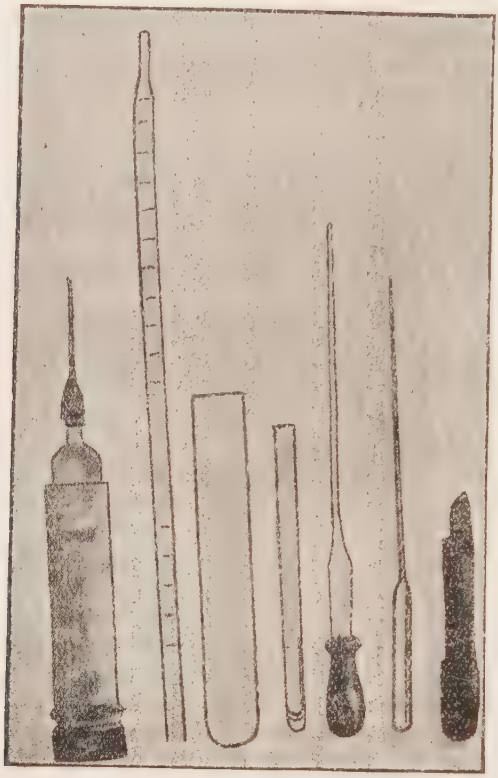


Fig. 1.

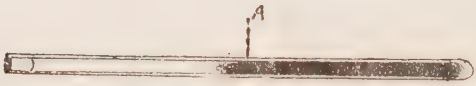


Fig. 2.

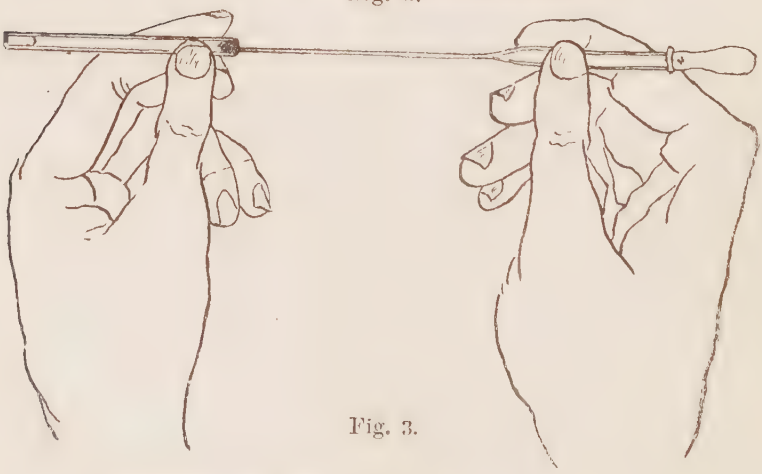


Fig. 3.

Apparatus for concentrating Malarial Plasmodia.

KRAUSS (William) & FLEMING (J. S.). **A Concentration Method for the Diagnosis of Malaria.**—*Southern Med. Jl.* 1916. Feb. Vol. 9. No. 2. pp. 141–145. With 2 figs.

The method is recommended in preference to the thick-film, as it is designed to remove the leucocytes, disintegrate the red cells, and exhibit the freed parasites in bulk.

A sterile bottle is part-filled with 10 cc. (or more if desired) of a solution made by adding 2 grammes of acid-free sodium citrate and 0·85 gramme of pure sodium chloride to 100 cc. of fresh-distilled water.

The blood to be examined is drawn from a vein by a sterile 2 c.c. all-glass syringe already part-charged with 0·5 cc. of the acid-free citrate solution, and the syringe full of the mixed blood and citrate solution is emptied into the bottle containing the rest of the citrate solution.

To free and preserve the parasites some 1 to 10 neutral solution of the official 37 per cent. formal is now added. A table showing the amount of this solution that may be added according to effects desired is given, but if a bottle originally containing 10 cc. of the citrate solution has been adopted the addition of 0·5 cc. of the 1 to 10 formal solution is usually sufficient. With this strength small rings are preserved in an hour, and larger forms in four hours.

The mixture is now spun for 10 to 15 minutes in the tube of a high-speed centrifuge, so that the leucocytes may be pipetted off. The pipetting must be done very carefully, otherwise gametes and large schizonts may come with the leucocytes. The tube is then filled up with distilled water, shaken to complete the liberation of the parasites, and again spun in the centrifuge, and after this the fluid is poured off and the precipitate containing the parasites is drained on to a slide, fixed, and stained.

If haste is desired the formal solution may be added at the source. Or if the blood comes from a long distance (24 to 48 hours, e.g.) two drops of the formal solution should be added to every 10 cc. of the mixture of citrate solution and blood, before it is sent.

A. A.

BROHIER (Sam. L.). **A Case of Masked Malaria.** (Correspondence.) —*Lancet.* 1916. Jan. 22. pp. 211–212.

An abstract of a case from the Gold Coast in which with an abundance of malarial parasites in the blood no clinical indication of malaria was apparent. The patient, a European, aged 33, had been accustomed to consume the better part of a bottle of whiskey daily. On admission to hospital though he had no fever, and no symptoms except casual vomiting, plenty of young forms of the subtertian parasites were found in the blood. The next day he was "practically well," and thereafter remained so, with the temperature subnormal, though an examination of the blood on the 14th day revealed numbers of crescents.

In speculating upon these conflicting phenomena the author impartially advances two alternative assumptions which might be held to explain the absence of the usual febrile symptoms, namely (*a*) that it might indicate an antitoxin competence, and so be evidence of immunity; or (*b*) that it might intimate a failure of reaction, and

so, notwithstanding the apparent well-being, might be presumptive of danger or even (with some very slight exciting cause) of an approaching catastrophe like coma or an attack of blackwater. In this particular case the author seems rather to incline to the latter assumption and attributed the "masking" of the febrile symptoms to the alcohol to which the patient was addicted. He further hazards the speculation that influences other than those attributable to alcohol may bring about a similar "masked" condition fraught with the same possibilities of disaster.

A. A.

MARTELLI (Pier Nello). **Contributo alla conoscenza del "tremore da malaria."** [A Contribution to our Knowledge of Malarial Tremor.] —*Malariologia.* 1915. Dec. 15. Vol. 8. No. 6. pp. 143–152. With 1 fig.

An account of two cases of tremor of the limbs coming on in the course of malaria, and subsiding with the disappearance of parasites from the blood, after the administration of quinine. Only two indubitable cases of this condition are on record, by FORNACA and CANTIERI [*Rivista Critica di Clinica Medica* 1912].

The patients in the present case were two brothers, aged respectively 6 and 4 years. An illustration is given of the elder child in a characteristic attitude. The head was retracted towards the left shoulder, while the right arm was strongly flexed at the elbow, and pronated, with the fist clenched; the left arm was similarly affected to a less degree. Both arms were agitated by a constant tremor, which persisted during sleep and was exaggerated on attempting to grasp anything. Aestivo-autumnal parasites were found in the blood. On half-gramme doses of quinine by the mouth and by injection, the symptom began to diminish on the fourth day, and had completely disappeared by the 10th. The younger child was admitted to hospital on the same date, October 4th, 1915, and presented the same symptoms in a slighter degree. It had already received a few doses of quinine, and the symptoms consequently began to diminish on the day after admission. Parasites of the same type were present in the blood. A similar treatment was adopted and the child left the hospital perfectly cured along with its brother on the 23rd of the month. The mother of the two children was under treatment in the hospital at the same time for the same description of fever.

Three other cases of malarial tremor are on record, by JOURDRAN, SPAGNOLIO and DE VILLA, but the author considers them less typical. The differential diagnosis is discussed at length.

J. B. Nias.

MONAGAS (Jesus). **Algunas consideraciones acerca de fenomenos cerebrales de orden meningeos, observados en niños afectados de infeccion paludica algida.** [Some Remarks on Cerebral Symptoms of a Meningeal Nature, observed in Children attacked with Pernicious Malarial Fever.]—*Bol. Asoc. Med. de Puerto Rico.* 1915. Dec. Vol. 12. No. 109. pp. 277–282.

Some brief notes on cerebral symptoms observed in six children, of ages ranging between 18 months and three years, who were attacked with pernicious malarial fever. Five recovered, while one died comatose within 24 hours of the commencement of symptoms. The treatment adopted was of an ordinary nature and consisted of baths, calomel and injections of quinine. The author observes that the possibility of a microscopic diagnosis is often precluded by the urgency of the symptoms.

J. B. N.

von Dziembowski (Sigismund). **Ein Malariarezidiv nach Typhusschutzimpfung.** [A Malarial Relapse after Inoculation for Typhoid.]—*Deut. Med. Woch.* 1915. Nov. 4. Vol. 41. No. 45. p. 1331.

A Russian prisoner of war was inoculated against typhoid and cholera. The effect of the inoculation was to cause an attack of malaria, in which benign tertian parasites were present in the blood. The paper shows that such inoculations may bring about relapses of malaria after fairly long intervals of freedom, though the exact period of immunity from the disease is not mentioned in the text.

C. M. W.

Hall (G. C.). **Quinine and Malaria.** (Correspondence.)—*Indian Med. Gaz.* 1916. Feb. Vol. 51. No. 2. p. 72.

From three years' experience with Indian troops in one of the most malarious districts in Upper Burma, where "no amount of quinine" brought down the percentage of sick-in-hospital (mostly malarial fevers) below 40 to 80 per cent. of regimental strength, the writer long ago drew the conclusion that "the curative effect" of quinine "in malaria is very slight indeed"; and in some selected extracts from the Indian Sanitary Report for 1913 recording (*a*) high permillages of admission for malaria in three large military centres where quinine was used according to custom, and (*b*) the isolated statement of a medical officer in one of these places that "the parasites resisted the effects of cinchonization," he finds complete confirmation of his own independent conclusion. And on conjecture of this kind he would "depose quinine from its pedestal and substitute iron," and would reprove the "bland and childlike faith" of those who treat malarial fevers with the old specific drug.

An argument not based on exact and exhaustive observation, from every point of view, may yet be entitled to respectful consideration if it conform to the rules of logic, and be expressed in terms that are quite precise. Here, however, the obvious fallacies of confusion only serve to bring to mind the aphorism of that sage old philosopher Thomas Hobbes, that the one thing needful in scientific criticism is "perspicuous words by exact definition first purged and snuffed from ambiguity."

A. A.

Macdonald (Angus). **Quinine as Prophylactic in Malaria.** (Correspondence.)—*Trans. Soc. Trop. Med. & Hyg.* 1915. Dec. Vol. 9. No. 2. p. 74.

A letter chiefly remarkable for the stark enunciation of the proposition "that the general faith in the efficacy of quinine is a great hindrance to the elimination of the conditions that produce malaria, and that no sanitarian is justified in employing quinine as part of his warfare." To such a bald thesis most men will be content to answer, in the time-honoured academic fashion, *Nego.*

A. A.

ROUX (F.). **Les injections intra-veineuses de quinine basique à très faibles doses, dans la fièvre paludéenne.** -*Bull. Acad. Méd.* 1916. Feb. 1. Vol. 75. Ann. 80. No. 5. pp. 122–124.

Advocating the intravenous injection of quinine in weak doses. The injection used is a "pseudo-solution" of "basic quinine" of the strength of 2 to 3 mgm. in 1 cc. From 2 to 4 cc. of the "pseudo-solution" (according to the gravity of the case) are injected, with repetition, if necessary, the following day, or of half the original dose on the two following days. There is an evanescent reaction—rigors, which may be severe, and a rise of temperature, which in cases of heavy infection may reach 104° Fahr., or even higher.

It is claimed that this method is promptly efficacious against the access of fever where other methods of administering quinine have failed, and that probably its action upon all forms of the parasite is equally decisive, since in cases where the spleen is enlarged there is a rapid and very marked decrease of the hypertrophy and of the pain on pressure. A. A.

LANE (Clayton). i. **Quinine in Malaria.** (Correspondence.) -*Indian Med. Gaz.* 1915. Aug. Vol. 50. No. 8. p. 314.

ii. **Tetanus and Hypodermic Quinine.** (Correspondence.)—*Ibid.* 1916. Jan. Vol. 51. No. 1. p. 33.

i. A mild censure of some defaults in STOTT'S "Studies of Malaria" [this *Bulletin*, Vol. 6, p. 77], pointing out that in the administration of quinine, in cases where gastric absorption is doubtful, the hypodermic method is not a sole alternative to giving it by the mouth, but that two other options are well known, namely the intravenous and the rectal—the latter being extremely efficacious. Even when gastric absorption seems to be checked it is as well to make sure by trying the more soluble salts of quinine, for the writer states that in his own experience cases of malaria which have stubbornly resisted the sulphate have yielded at once to the extremely soluble bi-hydrochloride. The writer concludes by condemning the publication of *ex parte* objections to quinine, as tending to disparage the antimalarial measures of the Indian Government.

ii. A further criticism of STOTT'S opinions upon quinine, again pointing out that the hypodermic method is not the absolutely necessary alternative to administration by the mouth, and gently ridiculing squeamish objections to the rectal method. A. A.

STRICKLAND (C.). **Short Key to the Identification of the Larvae of the Common Anopheline Mosquitos of the Malay Peninsula. (For the Use of Medical Officers, and Others.)**—Illustrated by Miss K. O'CONNOR.—18 pp. Imp. 8vo. With 7 plates. 1915. Kuala Lumpur: Central Survey Office, F. M. S. [Price $2.00].

Plates and tables differentiating, by means of the bristles of the clypeus and the cockades of the abdominal terga, the larvae of eleven common species of Anopheles of WALLACE'S Indo-Malayan Subregion. The inquirer is reminded that the specific characters are not acquired until the larva is fairly well grown. Due acknowledgment is rendered to the careful and critical researches of Dr. A. T. STANTON.

It is concise perspicuous work of this kind, condensed upon recognised geographical regions, that medical officers want. A. A.

CHRISTOPHERS (S. R.). **The Pilotaxy of Anopheles.**—*Indian Jl. Med. Research.* 1915. Oct. Vol. 3. No. 2. pp. 362–370. With 1 plate.

The interest of this paper is purely academic. The bristles of the head, thorax, and appendages are very fully and carefully described, and are shown to have a definite arrangement and to exhibit some specific modifications which, in the author's opinion, are worthy of comparative treatment from a phyletic standpoint.

A. A.

CHRISTOPHERS (S. R.). **The Male Genitalia of Anopheles.**—*Indian Jl. Med. Research.* 1915. Oct. Vol. 3. No. 2. pp. 371–394. With 6 plates.

Apart from its wealth of interesting and original descriptive detail the main bearing of this paper is taxonomic. The structure of the organs in question is described, and attention is directed particularly to certain bristles or spines, termed "claspette spines," having a definite location at the base of the claspers. The number, arrangement, and nature of these spines is shown—over a very extensive field of investigation—to be correlated with certain features of wing-colouring and vesture of prosternum, and also with the form of the larval cockades. In the characters of the male genitalia the author thus finds general confirmation of his previously published views of the classification of Anopheline mosquitoes. The author's original observations are illustrated by 36 well-executed figures.

A. A.

OVAZZE (V. E.). **La malaria di Maccarese (1903-1914).** [Malaria in Maccarese from 1903–1914.]—*Giorn. d. R. Soc. Ital. d'Ig.* 1915. May 31. Vol. 37. No. 5. pp. 129–139. With 2 charts.

An administrative report on the progress of the malaria campaign in the district of Maccarese, near Rome, during the last 12 years. The great difficulty in this district, as in many others, is the large percentage of temporary agricultural labourers, who pass from under observation at the end of the summer imperfectly cured, to reappear in the following season as foci of infection. The district is one in which the prevalence of mosquitoes, and consequently of malaria, is remarkably dependent on the character of the season (v. Table I.).

J. B. N.

ZORINI (Carlo Omodei). **Della malaria e del suo avvenire in Lomellina.** [Malaria and its Incidence in Lomellina.]—*Malariologia.* 1915. Dec. 15. Vol. 8. No. 6. pp. 153–156.

A statistical report on the township of Candia Lomellina, showing a diminution of two-thirds in the number of cases of malaria in the last seven years. In 1914, only 34 cases of malaria were detected in a population of 3,000 persons. The quantity of quinine distributed amounted to, roughly, 8½ kilos.

J. B. N.

The Incidence of Plague in Europe.

The following statement has been received from Dr. C. Strickland :

" Dr. Henderson Smith criticising my contentions regarding the incidence of plague in East Anglia says that these seem quite unjustifiable [this *Bulletin*, Vol. 6, p. 411].

" The position is therefore this :—I say that there was scarcely any infection in 15,000 rats, because they were dispersed over the countryside. Dr. Henderson Smith says that these rats were so slightly infected because they were not as a population infected—(" It is of course only for infected populations that the relation between flea-rate and incidence is held to exist ")—which is, it seems to me, begging the question.

" I have attempted to give an explanation of *why* these rats were not infected, based on the late Mr. Merriman and my flea-work in East Anglia ; why in winter there should be much more likelihood of epizootics ; and why at any time there is very little chance now of epidemic plague ; and even if some reason for the non-infection, other than that the rats are not infected, be forthcoming for explaining the phenomena, nevertheless I have shown that there is a factor which is at least a powerful influence in the scale.

" Of course the climate of England may have changed so much since the 17th century that plague cannot now flourish, or the rats may be immune, or there may be other reasons for the facts as we now see them. Whatever they are, it would be most interesting to hear what they are from anyone who has a suggestion to make or some facts to give. At present the only argument in the field is that based on the bionomics of the brown rat."

HORLICK'S MALTED MILK

AS A DIET IN TYPHOID

A food, embodying the fats, proteids, and carbo-hydrates of pure, full-cream milk and choice malted grain presented in a form so palatable and digestible that it is used with convincing results in Typhoid and Gastro-intestinal disorders. It is a reliable reconstructive of waste tissue and is very efficient in maintaining strength and vitality.

Offered in Sterilized Glass Containers, especially adapted for use in the Tropics.

Samples to the Profession free by post on application to

HORLICK'S MALTED MILK CO., SLOUGH, BUCKS., ENG.

Fourth Edition. Enlarged. Pp. xviii + 436, with 113 Illustrations, including 5 Plates. Price **6s.** net (postage 5d.)

CROSS & COLE'S

MODERN MICROSCOPY

With Chapters on Special Subjects by

C. ANDREWS, F.R.M.S.; F. J. CHESHIRE, F.R.M.S.; A. EARLAND, F.R.M.S.; C. F. ROUSSELET, F.R.M.S.; T. H. RUSSELL, F.L.S.; C. D. SOAR, F.L.S., F.R.M.S.; and W. MARK WEBB, F.L.S.

Mr. J. E. Barnard (Lecturer in Microscopy at King's College), reviewing this book in "Knowledge," says: "It may with confidence be recommended as a safe guide for those entering on any field of work that involves the use of the microscope."

BAILLIÈRE, TINDALL & COX, 8, Henrietta Street, Covent Garden, London.

BAILLIÈRE, TINDALL & COX,

PUBLISHERS

AND BOOKSELLERS

OF ALL

MEDICAL WORKS.

LIBRARIES IN ANY PART OF THE WORLD SUPPLIED.

SUBSCRIPTIONS TAKEN FOR ANY PERIODICAL.

All Recent Publications Stocked and Orders Despatched by Return Mail.

BAILLIÈRE, TINDALL & COX,

8, Henrietta Street, Covent Garden, London.

Reprints and Pamphlets received:—

BULLETIN OF THE ST. LOUIS UNIVERSITY, 1916. Jan. Vol. 11. No. 6.—The St. Louis University Expedition to British Honduras for the Study of Tropical Diseases.

CHALMERS (A. J.) & ARCHIBALD (R. G.). Babesia or Piroplasma: A Reply to Dr. Leiper.—*Jl. Trop. Med. & Hyg.*, 1915.

CHALMERS (A. J.) & ATIYAH (S.). Streptococcal Puerperal Fever in the Anglo-Egyptian Sudan.—*Jl. Trop. Med. & Hyg.*, 1916.

CHALMERS (A. J.) & MARSHALL (A.). Nile Boils in the Anglo-Egyptian Sudan.—*Jl. Trop. Med. & Hyg.*, 1915.

FANTHAM (H. B.) & PORTER (A.). Notes on Certain Protozoa which may be found in Cases of Dysentery from the Mediterranean War Zone.—*Proc. Cambridge Philosoph. Soc.*, 1916.

FLU (P. C.). De gistingsproef van C. Eijkman ter opsporing van faecale verontreiniging van water.—*Geneesk. Tijdschr. v. Nederl.-Indië*, 1915.

FLU (P. C.). Epidemiologische studiën over de cholera te Batavia, 1909–1915.—*Geneesk. Tijdschr. v. Nederl.-Indië*, 1915.

FLU (P. C.). De levensduur van choleravibrionen in en op den grond van "Cholerakampongs" te Batavia, en de bodemtheorie der cholera asiatica van Max Pettenkofer.—*Geneesk. Tijdschr. v. Nederl.-Indië*, 1915.

KING (W. V.). Anopheles Punctipennis, a Host of Tertian Malaria.—*Amer. Jl. Trop. Dis. & Prevent. Med.*, 1916.

LAFFONT (A.). La Fièvre Ondulante dans ses Rapports avec la Grossesse l'Accouchement et les Suites de Couches.—*Arch. d'Obstét. et de Gynécol.*, 1915.

LAVERAN (A.). Infections expérimentales de la souris par la Leishmania tropica; un cas d'infection par la voie digestive.—*C. R. Acad. Sci.*, 1916.

LAVERAN (A.). Présentation de moustiquaires destinées spécialement aux troupes en campagne et aux voyageurs.—*Bull. Soc. Path. Exot.*, 1916.

LAVERAN (A.). Diminution de virulence chez des trypanosomes ayant subi un grand nombre de passages par animaux de même espèce.—*Bull. Soc. Path. Exot.*, 1916.

LOW (G. C.). Amoebic Dysentery.—*Practitioner*, 1916.

MALLY (C. W.). Note on the Use of Poisoned Bait for controlling the House Fly, *Musca Domestica*, L.—*S. African Jl. Sci.*, 1915.

MARSHALL (A.). A Rapid Method of isolating the Meningococcus.—*Lab. Jl.*, 1915.

OTTOLENGHI (D.). Ricerche sperimentali sulla purificazione dell' acqua per le truppe col cloruro di calce.—*Igiene Mod.*, 1916.

Reprints and Pamphlets received—*cont.*

OTTOLENGHI (D.). La preparazione del vaccino anti-colerico per le truppe.—*Igiene Mod.*, 1915.

RANSOM (B. H.). Effects of Refrigeration upon Larvae of Trichinella spiralis.—*Jl. Agric. Res.*, 1916.

Note.—On direct application (not through agents or booksellers) any of the foregoing reprints or pamphlets will be sent on loan to any part of the world, the Bureau paying outward postage.

Books received.

HOWARD (Leland O.), DYAR (G.) & KNAB (Frederick). The Mosquitoes of North and Central America and the West Indies. Vol. 1. A General Consideration of Mosquitoes, their Habits and their Relations to the Human Species.—vii+520 pp. 1912; Vol. 2. Plates (150 plates comprising 711 figs.), 1912; Vol. 3. Part 1. Systematic Description (in two parts). vi+523 pp. 1915. Washington: Carnegie Institution.

INDEX CATALOGUE of the Library of the Surgeon General, U.S. Army. Second Series. Vol. 20. V.—Water-Works. 595 pp. 1915. Washington: Govt. Printing Office.

Le PRINCE (Joseph A.) [C.E., A.M.], & ORENSTEIN (A. J.) [M.D.], with an Introduction by HOWARD (L. O.) [Ph. D., L.L.D.]. Mosquito Control in Panama. The Eradication of Malaria and Yellow Fever in Cuba and Panama.—xvii+335 pp. Demy 8vo. With 100 Illustrations. 1916. New York and London: G. P. Putnam's Sons. [Price 10*s.* 6*d.* net.]

de SOUZA ARAUJO (H. C.). Estudo clinico do Granuloma Venéreo. Trabalho do Instituto Oswaldo Cruz. These Inaugural approvada com Distincçao.—123 pp. With 7 plates. 1915. Rio de Janeiro: Typ. do Journal do Commercio, de Rodrigues & C.

BUREAU NOTICES.

Works in the Bureau Library may be consulted between 10 and 5.

The Director can be seen between 10 and 1; for a later hour an appointment should be made.

The Director will be glad to receive early copies of works or reprints on Tropical Diseases for notice in the *Bulletin* and for the Library. To be addressed—Tropical Diseases Bureau, Imperial Institute, London, S.W.

(Telephone:—Kensington, 5188.)

The Annual Subscription for the Tropical Diseases Bulletin is TWENTY-ONE SHILLINGS post free.

Subscriptions should be sent to Messrs. BAILLIÈRE, TINDALL and COX, 8, Henrietta Street, Covent Garden, London, W.C., who are also the advertisement agents.

Cloth cases for binding the Bulletin can be obtained from Messrs. BAILLIÈRE, TINDALL and COX, price One Shilling and Sixpence post free.

The Tropical Diseases Bureau publishes also the TROPICAL VETERINARY BULLETIN, quarterly, Annual Subscription Ten Shillings, single numbers Three Shillings post free; to be obtained from the above agents.

TO ADVERTISERS.

To ensure the insertion of an Advertisement in any particular number of the Bulletin the copy must reach Messrs. BAILLIÈRE, TINDALL & COX not later than fourteen days before the date of publication.

CONTENTS.

AMOEBIASIS AND DYSENTERY.

PAGE.

Ross & Thomson: Studies on Egyptian Sand Amoebae .. 195
Gauducheau: Criticism of Recent Works on the Pathogenic Role of the Amoebae 197
Lynch: The Rat a Carrier of a Dysenteric Amoeba .. 198
Barlow; Low: Treatment of Amoebic Dysentery and Carriers with Emetine 199–200
Bayma: Adrenaline in Amoebic Dysentery 201
Hammacher: Tannin Injections in Amoebic Dysentery .. 201
Job & Ernoul: Amoebic Dysentery contracted in France .. 202
Rencurel: Two cases of Predysenteric Jaundice 202
Elliott: Liver Abscess 203
Gauducheau: Spirillar Infection of Amoebae 203
Macfie: Dysentery in a Monkey 204
Escomel: A Biological Phenomenon in Amoebic Dysentery .. 204
Smith & Barrett; Williams, von Sholly, Rosenburg & Mann; Lynch; Craig; Johns; Lynch; Hoxie: Endamoebiasis of the Mouth 204–10
Evans, Middleton & Smith: Endamoebiasis of the Tonsil and Goitre 210
Kruse: Dysentery in Peace and War 211
Matthes; Kittsteiner: Outbreaks of Bacillary Dysentery.. 212–3
Job: Bacillary Dysentery and Paratyphoid Infections .. 214
Penfold: Dysentery in Children due to *B. dysenteriae* Flexner 214
Rencurel: Pulse Frequency in Diagnosis of Bacillary Dysentery 214
Rauch: Periosteal Lesions after Dysentery 215
Schlesinger: Dysenteric Polyneuritis 215
Oppenheim: Suprarenal Insufficiency in Dysentery 215
Parhon: Adrenaline in Treatment 216
Rogers: Sensitised Shiga and Flexner Vaccines in Treatment 217
Stoerk: Treatment of Bacillary Dysentery 217
Bujwid: Treatment by Dysentery Serum 218
Hever & Lucksch; Pratt-Johnson & Milne: Immunisation against Dysentery 218–9
Kuenen: Bacillary Dysentery in Delhi 219
Denier: Bacillary Dysentery in Saigon.. 220
Nisbet: Bacillary Dysentery in North Queensland 221
Loewenstein: Dysentery Bacilli in a Horse Pond 221
Přibram: The Task of the Bacteriologist in Bacillary Dysentery 221
Salus; Egyedi & Kulka; Sonne; Duenner; Seligmann & Cossmann; Strauss: Bacteriological Diagnosis 222–4
Negre: Bacillary Dysentery in Algeria 225
Fraenkel: Investigation of Pseudo-dysentery, Y type .. 225
Remlinger & Dumas: Dysentery in the Argonne 226
Ledingham & Penfold: Serological Tests in Dysentery Convalescents 226
Castellani: Treatment of Flagellate Dysentery 226
Barlow; Zuloaga: Balantidiosis 227
Ravaut & Krolunitski: Dysentery due to Amoeba + Bacilli 228
Ledingham, Penfold & Woodcock: Recent Bacteriological Experiences in Dysentery 228
Ismail: Diarrhoea in Gallipoli. 230
Wenyon: Observations on the Common Intestinal Protozoa of Man (fig.) 231
Fantham & Porter: Protozoa in Cases of Dysentery from the Mediterranean 232
Escomel: Dysentery in Arequipa 232
Noc: Dysentery in Cochin China 233

ROSS; MARCOVICI & PŘIBRAM; DU MONT; ARNOLD; BALFOUR: Treatment of Dysentery 233–6
GLASSON: Bismuth—X-Ray Localisation of Ulcers 236
HIRSCH: Dysentery and its Treatment 236
WHITTAKER: A Water-borne Dysentery Epidemic 236
DALE; VELAZCO: Chronic Poisoning by Emetine 237

CHOLERA.

MUELLER; SCHUERMANN & FELLMER; BOETTICHER; STERN; CASTELLI & VIGANÒ; KOEHLISCH & OTTO; BALDONI; SOBEL; YAKIMOFF & DEMIDOFF: Diagnosis of Cholera .. 239–42
LOEWY: Cholera Vibrios and Haemotoxins 242
GAUDUCHEAU & PELTIER; Cholera Vibrio from Tonkin .. 243
BAIL: Variability of *V. cholerae* 243
ROHBERG: The Role playable by *Aphiochaeta ferruginea* in the Spread of Cholera 244
GREIG: The Vibricidal Power of the Bile after Administration of Urotropine 245
GREIG: Production of Gallstones in Rabbits after Inoculation of Vibrios 249
McLAUGHLIN: The Control of Cholera on International Trade Routes 249
CARTRON: Washing Stations in Cochin China 250
DETRE: Prevention of Cholera in a Prisoners' Camp 250
FAICHNIE: Gastric Juice and the Prevention of Cholera .. 250
GELARIE: Vitality of Cholera Vibrio in New York Bay .. 251
GIOSEFFI: Markets as Centres of Cholera Infection 252
ROGERS & SHORTEN: Alkalinity of the Blood in Cholera .. 252
ROGERS: Cases treated by Atropine, Hypertonic Saline, and Permanganate 252
SINTON: Cases treated by Rogers' Method 254
VALK: Patients treated in Batavia 255
STRAUSS: Saccharine Injections in Cholera 255
PETROVITCH: Bacterio-Therapy in Cholera in Serbia 255
CASTELLANI & MENDELSON; SCHMITZ; von LIEBERMANN & ACÉL; BUJWID; SEIFFERT; von WASSERMANN & SOMMERFELD; Immunisation against Typhoid, Paratyphoid, and Cholera 256–60

MALARIA.

PUNJAB: Malaria in, during 1914.. 261
STRICKLAND: Epidemiology of Malaria in the Malay Peninsula 262
STRICKLAND: Outbreak of Malaria at Morib, F.M.S. 263
MORRIS: Malaria on Ship-board at Tampico 263
BAHRENBURG: Malarial Fever at Galveston 264
MITZMAIN: *Anopheles punctipennis* and the Transmission of Malaria 265
BARRET: Breeding Places of *A. punctipennis* in North Carolina 265
RIEGEL: Tropical Malaria in North Poland 266
SAINTON: Slight and unrecognised Forms of Malaria.. .. 266
BASS & JOHNS; KRAUSS & FLEMING: Concentration Methods for Diagnosis of Malaria (fig.) 266–9
BROHIER: Case of Masked Malaria 269
MARTELLI: Malarial Tremor 270
MONAGAS: Cerebral Malaria in Children 270
von DZIEMBOWSKI: Malarial Relapse after Typhoid Inoculation 271
HALL; MACDONALD; ROUX; LANE: Quinine in Malaria .. 271–2
STRICKLAND: Key to the Identification of Larvae of Malayan Anopheles 272
CHRISTOPHERS: Pilotaxy and Male Genitalia of Anopheles .. 273
OVAZZE; ZORINI: Malaria in Italy 273

STRICKLAND: The Incidence of Plague in Europe 274